Volume 94 Number 7

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

PLANTING both feet firmly on embattled ground, the iron and steel industry continues to maintain an alert defense against subversive attacks on the part of organized labor and governmental thrusts at the basing point system and open-price provisions of the steel code. p.10

GENERAL JOHNSON (NRA) is currently finding himself between the twin fires of industry and strong radical forces. p. 14

STABILIZATION of the dollar is applauded by two steel leaders as at least eliminating uncertainty. p. 11

VOTE on employe representation at an Alabama mill resulted in a landslide—86½ per cent in favor of the company's plan. p. 12

A NEW MILL for rolling up to 36-inch black plate for tinning, installed by a Chicago producer, is capable of heavy reductions and provides maximum delivery speed of 700 feet a minute. p. 27

OPEN-HEARTH OPERATIONS, surging upward, hit the 39 per cent level last week, and this week will probably cross 40—a new high since the second week of October. p. 13

SCALE REMOVAL from sheet bars is being accomplished in England by combination of water sprays, scrapers and wire brushes. p. 37

SWEDISH STEELS may find wider acceptance in this country following negotiations for a commercial treaty with Sweden. p. 10

IRON ORE is moving ahead to better days. In 1933 shipments rose to 21,672,410 tons, contrasted with a paltry 3,588,608 tons in 1932. Estimates of requirements this year run as high as 40,000,000 tons. p. 19

A REFRACTORY for use in steel heating furnaces, which is of chrome base and castable into any desired shape, has been effecting noteworthy economies. p. 28

CURRENT MARKETS are strong, swept higher by pending railroad tonnages and heavy automobile specifications. p. 43

FLAT-ROLLED STEEL tonnages are moving to Detroit as they have seldom moved before, automobile manufacturers becoming apprehensive over prices and possible shortages. Rumors of a new hot strip mill in the district are heard. p.15

ALUMINUM for deoxidizing or alloying molten steel is now available in the form of star-shaped castings which fit over the end of a stirring rod. p. 32

SEATTLE SEAWALL improvement made initial steel awards last week. p. 58

NICKEL CAST-IRON die, used by manufacturer of steel brake drums, gave 40,000 stampings without redressing. p. 34

CENTRIFUGALLY CAST PIPE produced in metal molds designed to avoid chilling of the iron shows advantages of greater impact strength, greater ductility, greater carrying capacity and lower cost. p. 23

"C" CLAMPS, their use stimulated by welded assemblies, account for nearly 500 tons of steel annually. p. 35

TUNGSTEN CARBIDE shows its mettle in tools for cutting and drilling glass. p. 34

"WE ARE APPROACHING in steel the day of intensive salesmanship, of advertising and of market promotion," comments a trade association executive. p.16

Institute Girds on Labor, Basing Points, Open Prices

AMERICAN IRON AND STEEL INSTITUTE deployed on three fronts last week to protect its position under the steel code—indeed, to insure that the chief reasons for its co-operation with NRA are not vitiated by ignorance of trade conditions.

At Washington, an attorney for the institute was conferring with the federal trade commission on the matter of basing points, the direct issue having been raised by the resolution of Senator Borah, adopted Feb. 2, requesting the commission to report on the price situation under the steel code.

The commission, which unofficially is understood to oppose the basing point provisions of the steel code on the ground that steel should be sold f.o.b. mill, has assigned Judge Robert E. Healy, its chief counsel, to the case.

Report in Fortnight

No hearings will be held and no investigation made, it is understood, and a report will go to the senate in two or three weeks. Under the commission's appropriation for this year it does not have to make investigations for either house of congress unless a concurrent resolution is adopted or a specific appropriation is made.

No official action, of course, has been taken by the institute and no official representations have been made, but it can be taken for granted that Washington has been apprised of the sentiment in the steel industry that if the basing point and open-price provisions of the steel code are withdrawn the code will virtually cease to exist for the steel industry.

The open-price situation is one that will probably develop later this month in Washington, but in speaking before the Del Monte conference of the iron, steel and allied industries of California, Friday, W. A. Irvin, president of the United States Steel Corp., upheld the industry's price policies under the steel code, pointing out that a single price protects small enterprises and provides a more stable market. This, it can be assumed, was by way of informing Washington of the industry's attitude.

Mr. Irvin also defended the present system of employe representation in collective bargaining, and made the point that increased costs under the code have not yet been fully met by advances in price.

Determined as the institute is to retain open prices and the present multiple bases, it is making its most vigorous stand on labor. Early last week it compelled NRA to take back the slur cast upon so-called company unions in issuing the President's executive order broadening the power of the national labor board, especially in the Weirton Steel Co. and Edward G. Budd Mfg. Co. cases.

The insinuation that company unions are operated by the employer rather than by employes themselves was withdrawn, but under the order, representatives of the labor board are preparing to take a poll of Weirton workmen to ascertain whether the Dec. 15 election was representative.

Despite a rainy day, almost 90 per cent of the 11,000 Weirton employes went to the polls, and company employes nominated by the employes themselves were overwhelmingly chosen in preference to candidates put forward by the Amalgamated Association of Iron, Steel and Tin Workers.

Last week at Pittsburgh, the Weirton Steel Co. and representatives of the labor board were jockeying for the inside position. On Monday, headquarters were set up at the William Penn hotel by Milton Handler and James F. Dewey, for the board.

At a conference with Earl F. Reed, counsel for the Weirton company, Messrs. Handler and Dewey requested access to payrolls of the company to provide the means for an accurate check of the wishes of employes. In the absence of E. T. Weir, chairman of the National Steel Corp., of which Weirton is a subsidiary, an impasse resulted.

Instead of taking a poll at Weirton, the board's representatives passed several quiet days in their hotel rooms, Mr. Handler returning to Washington and Mr. Dewey going on to Weirton where the Amalgamated made available to him a copy of the workers petition which the board desires to check against the payrolls.

New, Old and Square Deals

Referring to the Weirton case, NRA Administrator Johnson said Friday, "I don't think it is necessary to get the payroll to conduct the poll."

Mr. Handler in biding his time said: "The poll must be fair and unbiased. It will be necessary to have the co-operation of both sides."

Although not in direct reply to this statement, Mr. Weir said recently: "I am for the President but I also have considerable faith in, and an abiding respect for, the old deal. But, new deal or old deal we must have a reasonable assurance that it will be a square deal. The surest test of a square deal is when both parties are satisfied."

In the meantime, Attorney General Cummings, at Washington, announced that the department of justice had suspended its activities in the Weirton case pending the check by the labor board.

STEEL BASE INQUISITOR: Judge Robert E. Healy, chief counsel for the federal trade commission, who will compile the commission's answer to the senate resolution asking a report on steel prices under the NRA code, including the matter of basing points. Fifty-one years old, Judge Healy's background is law and lumber. At one time he was secretary of a Vermont lumber company, and he has served on both the Vermont supreme court and the United States court of customs appeals. Since 1928 he has been chief counsel for the commission

Washington

A COMMERCIAL treaty with Sweden involving, among other things, special steels, is being negotiated by the state department.

The treaty will be ready in two or three weeks. Unless special powers are granted by congress, such a treaty would need the senate's O.K.

¶The customs bureau of the treasury department is making an investigation of the alleged dumping of pig iron in the United States from Canada. The matter is being handled by correspondence. British manufacturers of semifinished steel, on the other hand, are disturbed because they have lost some business in Canada recently to an Ohio mill.

¶The federal export corporation to finance purchases in this country by the soviet government is still in process of negotiation.

¶Simplification and commercial standards work of the bureau of standards,

Washington, will be continued in co-operation with the American Standards association and other groups. At one time it appeared that the economy program of the government would eliminate practically all of this work. Priority will be given to those producer groups signifying their willingness to identify simplified items in catalogs and other trade literature.

Codes

MARCH 5 is the date set by Gen. Hugh S. Johnson, NRA administrator, for the general meeting of all code authorities in Washington.

A guide to what will happen to other NRA codes containing similar provisions may be deduced from the hearing scheduled for Feb. 20 on the gear manufacturing code. The provisions making data available to the code authority, the open-price system, and the requirement for a uniform accounting system are under protest, three manufacturers having petitioned for reopening.

¶Codes approved by NRA include foundry equipment, foundry supply, chain manufacturing, electric industrial truck manufacturing, chain hoist manufacturing, machine knife and allied steel products, and cast iron radiator industry.

¶Code hearings scheduled: Kalamein industry, Feb. 14; corrugated rolled metal culvert pipe industry, Feb. 21.

¶Colorado becomes the eleventh state to enact co-operative legislation with NRA, West Virginia indicating early action. The 11 states acting thus far are New York, New Jersey, Virginia, Ohio, Texas, California, Utah, Wisconsin, Kansas, Massachusetts and Colorado.

Transportation

THOUGH the "earmarking" issue on steel for fabrication has now been dropped (STEEL, Feb. 5, p. 15), it is understood that the railroads plan to investigate the entire FIT question to determine whether the privilege is being exercised by some manufacturers in other lines not entitled to it.

¶ICC has postponed for 60 days the effective date (Feb. 15) of its order increasing freight rates on coal from Ohio river points to various northern Ohio destinations. Last week, Youngstown, O., steel interests filed suit to enjoin the ICC increases.

¶Youngstown, O., and Newcastle, Pa., interests, expecting Maj. Gen. Edward L. Markham, chief of army engineers, to file a report favorable to the proposed canalization of the Beaver and Mahoning rivers, are contemplating the organization of a corporation not only to finance industry's share of the cost, but also prepare for navigation.

Originally, the cost of the Beaver-Mahoning project was $59,500,000, but a recent survey has reduced this to $41,000,000. Youngstown and Newcastle mills would have a water outlet to the Ohio river for finished products, with fuel for return trips.

¶Class 1 railroads in 1933 spent approximately $452,000,000 for materials and supplies, 2 per cent over the $443,000,000 of 1932, according to an estimate by *Railway Purchases and Stores*. The breakdown for 1933 is rails, $10,300,000, a decrease of 32.7 per cent; fuel, $177,800,000, a decrease of 6.1 per cent; cross ties, $22,600,000, a decline of 25.7 per cent; and all other material $241,300,000, an increase of 16 per cent. Material balances on hand last Oct. 31 include rails valued at $36,500,000, a decline of 22.7 per cent below the preceding year.

¶On pig iron from Providence, R. I., discharges to St. Johnsbury, Vt., freight rate has been reduced from $4.80 to $4.10 a ton.

Uses of Steel

DEMAND for earthquake-proof construction in southern California has increased the use of diagonal steel braces against wooden studding, even in small structures such as one-story stores and shops. Architects are specifying such steel braces in practically all new construction.

ONLY STEEL CAN MOVE A TREE: A 90-year old tree can be grown in your front yard in a day with the aid of this electric-welded steel mover made in the shops of the Davey Tree Expert Co., Kent, O., with equipment manufactured by the Lincoln Electric Co., Cleveland. The mover shown above is only a small one, of 10-ton capacity. Larger units handle 30 tons with ease—and safety

They Say:

NOTHING that has happened for many months has been so helpful in dissipating uncertainty and rebuilding confidence as the President's monetary proposal (stabilizing the dollar at 59c). There is evidence on all sides, in all branches of business, of a very definite upturn. The purchasing power of those who have been regularly employed, supported by those who are now and will be employed as a result of the billions of dollars of public works, will start and maintain a cycle of exchange."—Charles R. Hook, president, American Rolling Mill Co., Middletown.

¶"Conditions are so much better than at this time last year that we feel encouraged. I am not very enthusiastic about some of the weird propositions coming out of Washington, but so far as the currency is concerned, it seems to me that stabilization of gold at any point was better than uncertainty. The 'new deal' has knocked all our old-fashioned ideas about the sanctity of contracts into a cocked hat, has violated the rights of citizens guaranteed by the constitution, is piling up enormous taxes and is building a bureaucracy which we shall have difficulty in shaking off."—John B. Berryman, president, Crane Co., Chicago.

¶"I stand 100 per cent for observance of and enforcement of NRA. President Roosevelt is President of us all. I stand for co-operation with him and his recovery program. It is the duty of every citizen, whether employer or employe, to give that co-operation unstintingly. This is not the time for debate. It is a time to follow the leader."—Edward G. Budd, president, Edward G. Budd Mfg. Co. and Budd Wheel Co.

¶"None of us wants government ownership of the railroads. We fear it; we will do everything possible to prevent its being wished upon us."—John A. Coakley, general traffic manager of manufacturing subsidiaries, United States Steel Corp.

Labor

CAPTIVE coal mines of iron and steel producers will be in the news again shortly when United Mine Workers officials, in the majority representing employes, will seek to negotiate wage contracts. More than 20 representatives of independent steel companies discussed the problem last week at a meeting in Pittsburgh.

¶Meanwhile, at the Nemacolin mine of the Buckeye Coal Co., a subsidiary of the Youngstown Sheet & Tube Co., an election resulted in 489 votes for the United Mine Workers

and 249 for the company brotherhood. An election was held Thursday at the Searight mine of the Republic Steel Corp.

¶Tennessee Coal, Iron & Railroad Co.'s employe plan won by an overwhelming vote at a secret ballot on Feb. 2 conducted and supervised by committees of employes. The final count was 86.5 per cent of votes for the plan.

¶The first thousand days of safety are the hardest, according to the Universal Atlas Cement Co., subsidiary of the United States Steel Corp., but at its Universal, Pa., plant 1000 days with a lost-time accident ended Jan. 31. The Independence, Kans., plant became eligible for the 1000-day club Sept. 26, and the Duluth plant, Oct. 6.

¶If a 30-hour work-week were adopted it would require 15,152,131 workers to turn out the same volume of manufactures as was produced in 1929 by 8,838,743 wage earners working on a 48-hour basis, the National Industrial Conference board estimates.

A 30-hour week on the basis of last October's production would provide work for 7,979,000 wage earners, or 1,293,000 more than the number estimated to have been at work in October. Actual industrial unemployment in October is estimated by the board as 2,314,000.

¶Union Tool Co., Torrance, Calif., maker of chrome, manganese and vanadium steel, reports a scarcity of steel labor. The company's payroll in January set a two-year record, with 300 men.

Institute

PRICE changes filed with the American Iron and Steel institute the past week include:

Hot-rolled strip steel, 1.80c, base, Chicago, effective Feb. 15, narrowing the spread over Pittsburgh to $1.

Steel plate seconds, 1.20c, base, Coatesville, Pa., Feb. 1, following a previously-made price of 1.20c at Sparrows Point, Md., 1.15c at Gary, Ind.. 1.50c at Gulf ports, and 1.55c at Pacific coast ports. At all places, plate seconds assorted to gage are 10c higher.

Half round wire and oval wire, 3.60c, base, Pittsburgh, effective Feb. 5.

Bobbin ring wire, 4.55c, base, Worcester, Mass., effective Feb. 16.

Charcoal iron muck bar semifinished, $53.50 a gross ton, base, Philadelphia, effective Feb. 7.

Puddled iron muck bar, grade A semifinished, $63.50, base, Lebanon, Pa., effective Feb. 7.

Double refined wrought iron, 5c, Creighton, Pa., effective Feb. 7.

High speed hack saw sheet steel, 49.50c, tungsten hack saw sheet steel, 15.25c, and high molybdenum hack saw sheet steel, 22.50c, all base Pittsburgh, effective Feb. 17.

The quotation on special bar iron at Lebanon, Pa., is withdrawn as of Feb. 17.

Effective Feb. 5, 6 and 10 practically all grades and classifications of stainless steel have been reduced. Not all manufacturers, however, have participated.

¶Commercial resolution No. 45, effective Feb. 2, makes June 30 the final date for completing shipments of track material to manufacturers of railroad frogs, switches and other special track work, contracted for prior to March 1.

¶Commercial resolution No. 46, effective Feb. 2 and expiring April 30, provides special quantity differentials on sales of merchant steel bars in small lots to points in Colorado, Montana, New Mexico, Utah and Wyoming. On quantities less than 1000 pounds the new extra is 50c per 100 pounds, and on quantities from 1000 to 2000 pounds, 25c per 100 pounds.

¶Commercial resolution No. 47, effective Feb. 9 and expiring July 31, permits pig iron producers competing for business in territory normally served by the Granite City, Ill., furnace to deduct up to $2 a ton from the base at Chicago.

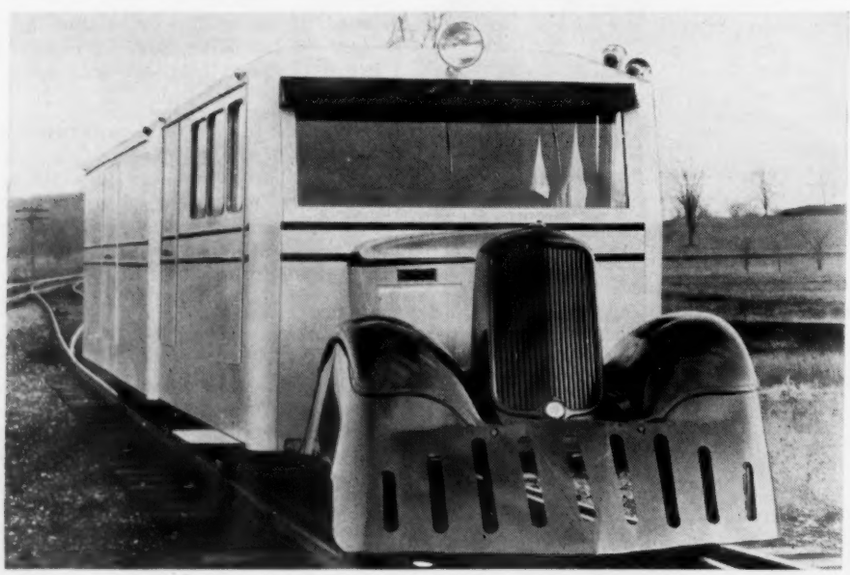
¶Commercial resolution No. 10, amended as of Feb. 9, permits deductions up to 38c per gross ton on southern foundry iron sold outside of the southern or Birmingham wage districts.

¶Commercial resolution No. 11, adopted Aug. 29, was rescinded as of Feb. 9. It concerned the place of delivery of plates, shapes and bars for an identified structure to which there is no through freight rate with FIT privilege.

¶Commercial resolution No. 16, amended effective Feb. 9, permits the addition of at least $1 per ton to the delivered price on products impossible to deliver by all-rail transportation.

¶Commercial resolution No. 27, amended effective Feb. 9, revises deductions from base prices of standard pipe, waterwell casing, rigid electrical conduit pipe and large OD pipe. Commercial resolution No. 42, amended effective Feb. 9, also revises deductions from base prices of pipe and other tubular products.

¶Commercial resolution No. 29, applying to the method of quoting railroads, was revised as of Feb. 2 to apply also to a trustee, mortgagee or lessor of equipment ultimately to be used by common carriers. Commercial resolution No. 38, amended effective Feb. 2, effects substantially the same end.



STEEL PANELS MAKE RAILCARBUS SAFE AND STURDY: Panels in this railway vehicle are of galvannealed steel sheets made by Republic Steel Corp., Youngstown, O., between which is a core of wood and cloth, forming what the makers call Met-L-Wood, strong and insulating. This train has superseded steam traction on the Hillsboro & North Eastern railroad in Wisconsin. It was built by Kalamazoo Railway Supply Co., Kalamazoo, Mich. The panels are by Met-L-Wood Corp., 6755 West Sixty-fifth street, Clearing, Chicago

Financial

REPUBLIC STEEL CORP., Youngstown, O., sustained net loss in 1933, after all charges, of $4,049,253, which was little more than a third of the deficit of $11,261,194 in 1932.

Net loss for the fourth quarter was $1,268,472, compared with a profit of $148,239 in the third quarter and a loss of $2,620,721 in the last quarter of 1932. Charges for 1933 included

$3,181,038 for interest, and $7,610,502 for depreciation and depletion.

¶Pressed Steel Car Co., Pittsburgh, reports net loss of $893,963 for 1933, against net loss of $1,436,171 in 1932.

¶Apollo Steel Co., Pittsburgh, reports net loss of $50,253 in 1933, compared with net loss of $131,254 in 1932.

¶Joseph T. Ryerson & Son Inc., Chicago, reports net profit of $301,490 in 1933, against net loss of $255,488 in 1932.

¶Warren Foundry & Pipe Co., Phillipsburg, N. J., shows net profit of $130,913 in 1933, against net loss of $49,940 in 1932.

¶Scullin Steel Co., St. Louis, reports a net loss of $609,325 in 1933, after all charges, against a loss of $575,933 in 1932.

¶Transue & Williams Steel Forging Corp., Alliance, O., encountered a net loss in 1933, after all charges, of $125,061, contrasted with loss of $142,673 in 1932.

¶American Steel Foundries, Chicago, preliminary report for 1933 shows a net loss of $1,400,640, after depreciation, taxes, etc., against net loss of $1,526,244 in 1932.

¶Allis-Chalmers Mfg. Co., Milwaukee, preliminary report for 1933 shows an operating loss of $1,462,694 against $1,353,326 in 1932. Orders booked in 1933 totaled $14,270,940, a gain of $1,954,384. Unfilled orders on Dec. 31 amounted to $6,425,998, against $5,441,825 at the close of 1932.

¶Great Northern Iron Ore Properties, St. Paul, reports consolidated net income, after all charges, of $282,902 in 1933, compared with $359,390 in 1932. Shipments from the properties in 1932 were 2,352,885 tons, compared with 487,217 tons in 1932. Cash on hand Dec. 31 totaled $2,993,987.

Operations

STEELMAKING operations increased last week 3 points to 39 per cent, highest rate since the second week of October, and if schedules are adhered to this week, will cross 40 per cent.

Every producing district except eastern Pennsylvania increased last week, Chicago gaining 6 points, Cleveland and Wheeling 5 each, and Youngstown and Buffalo 3 each.

No declines are scheduled for this week, while definite gains are in prospect at Chicago and Pittsburgh.

STEEL's operating rate for January, by the way, after adjustments for fractional weeks, averaged 33.81 per cent, compared with the American Iron and Steel institute actual figure of 34.13 per cent for the month. The institute's weekly estimates averaged 32.44 per cent.

Pittsburgh: Gained 2 points last week to 21 per cent, with a one point gain to 22 per cent forecast for this week Improvement was confined to independent plants, mainly on automotive sheets, strip and bars, two such producers now operating at 50 per cent of ingot capacity, their highest since last July. The leading interests, whose capacity is largely on railroad steel products, still reflect an unchanged slow rate. With one Cambria blast furnace taken off, 17 out of 60 steelworks stacks are now on in this district. Carnegie has 9 of 32 blast furnaces in, Jones & Laughlin 3 of 11, Bethlehem at Cambria 2 of 7, and National Tube, American Steel & Wire and Pittsburgh Crucible, one each.

Pittsburgh Steel Co. this week was to blow in one of its two blast furnaces at Monessen, Pa., where there has been no pig iron production since October.

Youngstown: Up 3 points to 44 per cent last week and expected to start this week at 45 per cent, due to a sharp increase in flat-rolled steel orders. Only pipe buying is lagging. Forty open-hearth furnaces were scheduled for this week.

American Can Co. Friday reopened its Newcastle, Pa., plant, suspended recently for a general overhauling, at full capacity.

Empire Sheet & Tin Plate Co. is lighting its fourth open-hearth furnace, giving it full operations, and may reopen its Falcon plant at Niles, O., for which the Ohio Corrugating Co., Warren, O., was recently negotiating.

Chicago: Rose more than 6 points to over 37 per cent, and further gains are in prospect this month. Nine of 36 steelworks blast furnaces are active. Rails are being rolled on light schedules

Central eastern seaboard: Sagged slightly last week, averaging 24 to 25 per cent. Recovery, however, is expected shortly, with the release of railroad tonnage.

Cleveland-Lorain: Up 5 points to 74 per cent, Corrigan, McKinney Steel Co. operating 13 open hearths; Otis Steel Co., eight; and National Tube Co., Lorain, eight.

Buffalo: Up 3 points last week to 37 per cent and probably improving to 42 per cent this week, with 16 open hearths on. If demand holds at present levels, operations will continue at or above 40 per cent through the quarter, steelmakers believe.

Detroit: Unchanged at 79 per cent, with 12 open hearths active, one of which is duplexing. This rate is expected to continue through this week.

New England—Unchanged last week at 82 per cent. The rate is expected to decline to 77 per cent this week, due to one steelworks equalizing its schedule to code hours.

Wheeling: Advanced 5 points last week to 69 per cent, with 27 out of 39 open hearths on in four district plants.

Birmingham: Steady at 52 per cent and likely to remain so until current railroad buying is worked off.

¶January output of open-hearth and bessmer steel ingots at 1,996,897 gross tons was almost double the 1,030,075 tons of January, 1933, and a third larger than the 1,459,450 tons of January, 1932. On a daily basis, January production averaged 73,959 tons, engaging steelmaking capacity 34.13 per cent. In January, 1933, the operating rate was 18.23 per cent, in January, 1932, it was 25.96 per cent, and in January, 1931, it was 43.80 per cent. The accompanying table is compiled by the American Iron and Steel institute.

Steel Ingot Production — 1933-34

96.57 Per Cent of Industry Reporting
Gross Tons

1933	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	No. of working days	Approximate daily output all companies	Per cent operation
Jan.	885,743	109,000	994,743	1,030,075	26	39,618	18.23
Feb.	922,806	126,781	1,049,587	1,086,867	24	45,286	20.83
Mar.	784,168	94,509	878,677	909,886	27	33,699	15.50
Apr.	1,180,893	135,217	1,316,110	1,362,856	25	54,514	25.08
May	1,716,482	216,841	1,933,323	2,001,991	27	74,148	34.11
June	2,211,657	296,765	2,508,422	2,597,517	26	99,904	45.96
July	2,738,083	355,836	3,093,919	3,203,810	25	128,152	58.95
Aug.	2,430,750	370,370	2,801,120	2,900,611	27	107,430	49.42
Sept.	1,991,225	242,016	2,233,241	2,312,562	26	88,944	40.92
Oct.	1,847,756	191,673	2,059,429	2,111,866	26	81,226	37.37
Nov.	1,331,091	156,939	1,488,030	1,540,882	26	59,265	27.26
Dec.	1,624,447	132,787	1,757,234	1,819,648	25	72,786	33.48
Total	19,665,101	2,428,734	22,093,835	22,878,571	310	73,801	33.95
1934							
Jan.	1,786,467	172,489	1,958,956	1,996,897	27	73,959	34.13

Figures exclude crucible and electric ingots. All the operating percentages are based on 67,386,130 gross tons annual capacity as of Dec. 31, 1932.

WINDOWS OF WASHINGTON

Johnson Is Between Fires
• • •
Labor Eyes Shorter Week
• • •
See Big Equipment Orders

WASHINGTON

EACH week Gen. Hugh S. Johnson, NRA administrator, appears to be moving farther into an exposed area where he is more likely to be on the receiving than the sending end of the famous "crack down." About the only thing anyone conversant with Washington at this time envies the General for is his luxurious vocabulary.

Labor, open prices and basing points are nipping the General's heels, and whichever way he turns he is certain to trample on influential forces. From more difficult situations than this he has extricated himself, but until congress adjourns—probably sometime in April—he is going to be in a vise.

Reports from all sections of the country indicate that labor is increasingly restive. Labor reads that sentiment in congress is for the 30-hour week, it is being agitated constantly by American Federation of Labor organizers, it reads that the General himself favors a shorter week than 40 hours and may propose a 32-hour week when code authorities meet March 5.

In case NRA puts its official strength behind a week shorter than 40 hours, the opposition of employers may reach the highest point since NRA was adopted. Most commitments are based on a 40-hour week, and a demand for a 30 or 32-hour week with 40 hours' pay would prove most damaging. It looks as if the general will have to decide between organized labor and industry.

The past few weeks General Johnson has indicated a little doubt, if not hostility, in the matter of basing points. The pressure from congress, the NRA consumers' board and now the federal trade commission has been strong. But it has filtered back to Washington the past week that if the basing point and open-price provisions of the steel code are eliminated or seriously revised, there may be no steel code. Incidentally, newsprint manufacturers want to set up basing points or zones, and have incurred considerable opposition.

On open prices, the consumers' board and congress both are in opposition. The fact that such provisions are in codes indicates that they have passed the cold eye of the NRA legal division. There is no open expression thus far of the General on this matter, but it is an issue that must be faced soon, perhaps at the meeting of code authorities.

Indirectly, the national labor board also is a vexing matter for the General. He has discreetly refrained from taking any sides in the Weirton case, but it has been deduced that he thinks the board's case is not strong. It has not added to the board's prestige that every time it locks horns with industry it has to run to the White House or to General Johnson for an additional grant of authority.

Secretary of Labor Perkins also is keeping a watchful eye on the board, and just as the trade commission presumbably would like to take over the permanent features of NRA—if any—the department of labor believes it to be the logical resting place for any permanent labor authority.

TO OFFICIAL Washington, these irritations do not mar the general picture, which is still bright.

In addition to looking for almost 500,000 tons of rails to come out for rolling between March 1 and June 1 —the remainder of the 845,000 tons promised by Railroad Co-ordinator Eastman, PWA is moving more rapidly on equipment business.

Including the 12,725 freight and 159 passenger cars just placed by the Van Sweringen lines, Washington expects about 17,000 more cars to be ordered shortly, bringing the car program up to 30,000. The Atlantic Coast Line, Illinois Central and Milwaukee roads may buy next.

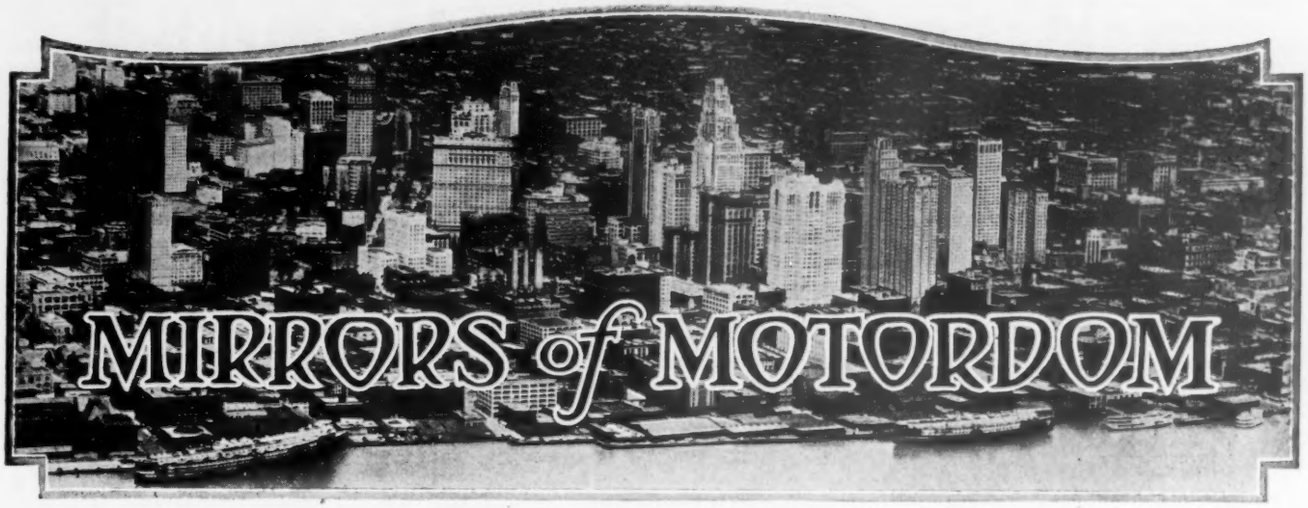
It required from early October to last week to conclude the negotiations for the PWA loan to the Van Sweringens, PWA lawyers being almost as critical as NRA ones. But with this large order out—the freight cars average a tare weight of 44,000 pounds, practically all of it steel—there is the suggestion of further good news shortly.

Each week sees the navy's engineers closer to the point where they can release the 75,000 tons or more of steel for the naval program, not including a similar tonnage for the Vinson 5-year plan. Stainless steel and welding equipment manufacturers will get the best "break" in the history of the navy department.

News of disturbances abroad is so much grist for the mill of the big-navy people, who incidentally are under the fire of Senator Nye. A resolution by him calls for a probe of the "armament industry."

Stainless steel also stands to benefit from the deportment of commerce's work on a low-price airplane, being developed with $500,000 from PWA. An inter-departmental advisory board on aviation was set up last week. CWA appropriations are supporting work on 745 airports, of which 406 are new. While 80 per cent of appropriations must be expended for labor, new hangars, lighting equipment and drainage represent possibilities for steel.

The home loan board also is developing as an outlet for steel. A corps of investigators is checking over mortgages of leading urban banks, both closed and open, with the object of taking over these obligations and freeing bank funds. In most cases provision is being made for necessary repairs, including spouting and a conservative degree of modernizing, which is expected to aid the plumber and hardware dealer.



Covering Widely on Steel
Plan New Hot Strip Mill
Production Gains Rapidly

DETROIT

AUTOMOBILE manufacturers may grouse over the price of steel. but in the meantime they are prodding their purchasing departments to lay hold on every ton they can get, especially sheets and strip.

For one thing, actual unfilled retail orders for automobiles are greater, taking the industry as a whole, than they were a month ago when a survey showed that the retail market can absorb every car made in the first half year.

Incidentally, this limit of a half year is not on account of any expected decline in the market during the summer months. but rather because July 1 is as far as most manufacturers care to look ahead.

For another reason, automobile manufacturers are so impressed with the broad market for their own product that they believe a genuine wave of recovery is rolling over the country and they visualize a shortage of steel once the railroads, the building industry, pipe lines and other large consumers of steel reenter the market.

A third reason is an underlying doubt concerning the labor situation in steel. No one has followed the Weirton case or the national labor board's gyrations more than automobile manufacturers, and they are apprehensive that a 60 to 70 per cent rate of steel operations may not only precipitate a shortage of labor but also breed difficulties.

A fourth potent reason is that the new streamline designs require wider sheets, the capacity for rolling which is limited, to say nothing of the technical difficulties of production which expand in more rapid ratio than the increase in width.

SO, RELEASES for steel, especially the flat-rolled lines, have been heavy the past two weeks. Two leading sheet steel producers, disposing of most of their tonnage in Detroit, are definitely out of the market for the remainder of the quarter. Another sheet mill, also prominent in this market, is expected to follow suit shortly.

Strip and sheet mills in the immediate Detroit vicinity are booked full and are operating accordingly. At least two small mills in the Youngstown district will resume shortly. A recent order for forging bars placed with a Cleveland producer has been estimated at as high as 250,000 tons.

As their larger and regular sources of supply become filled up, automobile manufacturers naturally are turning either to mills which have not shared in their business or to small producers who have been idle, such as those in the Youngstown district previously referred to.

To a large extent this situation accounts for reports that certain large automotive interests are "spanking" the steel industry because of its firm stand on prices. Some circumstances support such a theory, but the conclusion is chiefly erroneous.

It is true that automotive pressure on steel prices has been and is heavy. Recent reductions in stainless steel and hot-rolled strip are traceable to automotive influence, while rumors of an impending rise in sheets, proposed largely by smaller mills, have not provoked any enthusiasm here.

The argument of buyers is that steel is a tonnage industry, that present prices will prove amply remunerative as the industry crosses 50 per cent operations on the way up, and that any increase at this time would be a damper on expanding demand.

The attempt of General Motors to obtain an option on the Corrigan, McKinney Steel Co., Cleveland, and its subsidiary the Newton Steel Co., is attributed to a desire to exert an influence on the price situation.

At present this deal is off, chiefly because the offer was too low, but these properties, as indeed almost any steel unit, can be had at a price, and the question is whether General Motors figures that the end justifies the means.

While automobile purchasing officials are under constant pressure from their superiors to get the best prices obtainable, it is not likely that an industry which paints on such a broad canvas as the automotive industry does would wage a war of sabotage against essential, large supply industry.

Incidentally, it may be stated authoritatively that a Detroit manufacturer with a site within the switching limits of Detroit and close to the river, has plans to install a hot strip mill, with a possibility this may be changed to a Steckel-type unit.

On the site is a large vacant building, formerly a warehouse, which with little remodeling will be entirely suitable for the mill. Backers contemplate rolling only narrow sizes, from 4 to 14 inches, starting with a capacity of 6000 tons a month.

At present the Great Lakes Steel Corp. is the only producer of hot-rolled strip here. The Detroit Steel Co. and Bopp Steel Corp. cold roll.

SUPPORTING these heavy requirements for steel are increases in production, which for some interests are almost spectacular.

Chevrolet has accomplished almost the unbelievable. About New Year its daily assemblies were less than 100. Two weeks later they crossed 1000 a day, the following week crossed 2100, and the past few days have ranged slightly above 3300 daily.

Of the 60,000 units assembled by General Motors in January, well over half were Chevrolets. The original General Motors schedule of 100,000 units for February probably will be topped by 25 per cent. The tentative schedule of 130,000 units for March

likewise, is expected to be exceeded.

Recent sheet buying was featured by the scheduling of 200,000 jobs by Fisher Body, which recently found itself with barely 12,000 to 13,000 tons on hand, which would be enough for only 25,000 cars, and has been placing sheet orders since in much heavier tonnage. Of course, most of the 200,000 jobs are Chevrolets.

Ford is now up to about 4000 units a day, may turn out 70,000 to 75,000 cars this month, compared with actual assembly of 57,000 last month. The 10 per cent increase to 20,000 skilled workers at Fordson Feb. 6 presumably is preliminary to a raise in the base rate of $4 for common labor. Ford employment now approximates 90,000.

Plymouth, third of "the big little three," claims to have orders on hand for 71,000 models, and last week was assembling 750 to 800 units a day. Plymouth will shortly be on the air, making radio programs unanimous among these three. Ford inaugurated his semiweekly program Feb. 4, dealers by the way paying most of the bill, with Chevrolet planning to change its program in a month when its present contract expires.

Detroit understands that the present Hudson-Terraplane range may be broadened shortly to include additional body styles. The change is not imminent, however, as body and parts builders only recently were asked to bid, but Hudson-Terraplane dealers may have more to offer in the spring.

The Hudson-Terraplane schedule is now slightly under 500 units a day, chiefly of the Terraplane models. Over 11,000 men are now on the Hudson payroll, compared with 4600 a year ago, more than 3000 having been returned in the first week of February. Hudson-Terraplane dealers will hold regional and local meetings shortly in furtherance of the company's new field service development program.

Buick is proceeding at a 500-car a day clip, having assembled almost 10,000 units in January. Pontiac and Dodge also are making close to 500 cars a day. DeSoto and Chrysler have dropped the first of their new radically streamlined cars off the assembly line, but it will be 10 days before volume production starts. A source of supply on an important stamping was changed last week, with consequent delay.

In the upper price cars, Cadillac has been making a surprising showing. Compared with an actual production of about 6000 units in 1933, 10,200 are scheduled for the first half of this year, chiefly in the new low-price LaSalle range. January assemblies of Cadillac-LaSalle total 1700. Packard is at 75 to 100 units a day.

Chrysler, which last week placed an order for 190,000 sets of wheels with the Motor Wheel Corp., claims to have 90,000 orders for Plymouth, Dodge, DeSoto and Chrysler, four times the unfilled business a year ago.

Steel Never Fails, Finds New Outlets

A NEW world of opportunity for the use of steel, undreamed a few years ago, is foreseen by V. G. Iden, acting secretary of the American Institute of Steel Construction, in an address before the annual conference, Feb. 8, of the Iron, Steel and Allied Industries of California, at Del Monte, Calif. His theme was, "Steel Never Fails." Mr. Iden said in part:

One outstanding example is the production and use of stainless steel. First used in the making of cutlery, stainless steel was developed in England and Germany. In a commercial way it dates only from 1920. Today stainless is only one of the many steels of high strength that have been developed.

It was used in an industrial way first in the food and chemical industries. It particularly appealed here because of its resistance to stains and corrosion. Stainless steel was then utilized in architectural adornment in buildings and automobiles. As a structural material it may just now be coming into its own, and for that development civilization is deeply indebted to the steel industry.

Within the past year or so the engineering advisers of the industry have found ways of forming the material to give it a strength in compression comparable to its great strength in tension.

Economies in Transportation

As a consequence, airplanes of greater lifting power and less dead weight have been developed. Chassis for trucks and buses have been developed having but a fraction of their former weight, thus saving considerably in cost of operation. On the railroads also passenger cars are being built of this material which will outlast anything heretofore built, and weigh less than one-third of the old style car.

Air conditioning is a comparatively new industry. Steel sheets are important to that. In the future, air conditioning will not merely be required in public and semi-public buildings, but will invade the private homes. Steel sheets of this improved grade will make it easy. Equipment for the kitchen and bath, steel for floors, stairs, casements and partitions afford the rolling mills the hope that there is an insatiable market for their output.

Surveys show that probably 90 per cent of the residences of the city of New York are not fireproof. Not only the fireproofing, but all building restrictions on skyscrapers are the most rigid. The light occupancy building, with steel joists, steel floors, steel casements steel built-in cabinets, expanded steel lath and other steel equipment, can be built at prices which permit of reasonable rentals. A large latent demand exists for this type of structure and the engineering designs for them have been greatly improved and worked out to make them reasonable in price.

The H. H. Robertson Co., Pittsburgh, has designed and produced a type of steel floor that is quite an innovation. It is of a keystone cellular design manufactured in gages and sizes to fit any floor span desired, and also serves without extra cost as a completely flexible electric conduit system. During the past year it has placed this floor in over 100 projects. The Belmont Iron Works has also reported success with its type of steel floor, formed of interlocking light channels. With but a slight upturn in business the steel floor should rapidly come into greater prominence and work an important reformation in construction.

New Designs at World's Fair

Through the co-operation of the Inland Steel Co. the Mississippi Valley Structural Steel Co. and others, the industry produced the skyride at the Century of Progress exposition in Chicago, a structure in which welding was used to an unusual degree. This structure has balanced counterweight anchorages which, in effect, provided an articulated leg, and make possible the maintenance of a constant tension in the crossing cables.

Involving, as it does, many innovations in engineering design, the skyride makes a valuable contribution to the art of bridge building. The Chicago fair also enabled our engineers to try out successfully other innovations in steel buildings, proving that workable sheds and buildings can be erected economically and provide a maximum salvage value.

Despite the depression, the construction industry has produced, during the past year, or planned to produce, some outstanding structures. The Sunnyvale hangar, built for the navy in California, is now occupied. It has the largest floor space of any structure heretofore built. It is a monument to the possibilities of steel construction. Furthermore, it contains 22,000 square feet of flat steel-plate floor, a type of construction aggressively developed only within the past few years.

We are approaching the day of intensive salesmanship, of advertising and of market promotion. Under the codes we are adopting, salesmen can no longer hope to build up their quotas on a basis of price-bargaining. Sales must be predicated upon a better appreciation of the improved product and the improved methods of utilizing that product. Sales must be predicated upon a comprehensive merchandising program, and that includes better planned and more aggressive advertising.

It is not sufficient that we should know just that steel never fails. The world must be told about it. In that way only can we hope to reap the profit from these things we have created.

Industrial Men in the Day's News

Fred M. Fuller, General Sales Manager, American Sheet & Tin Plate Co.

Shortly celebrates his fortieth anniversary with this leading producer of sheets and tin plate.

His early industrial experience was gained in sheet mills in the Niles and Youngstown, O., district.

Though born in Ohio, he has been located in Pittsburgh for the greater part of his life.

FRED M. FULLER, newly-appointed general sales manager of American Sheet & Tin Plate Co., Pittsburgh, soon rounds out his fortieth year of experience with that company. This anniversary marks another year added to a successful and enviable record.

Though he has spent the greater part of his life in Pittsburgh, Mr. Fuller is a native of Ohio. At an early age he began work in some of the former sheet mills in the Niles and Youngstown, O., district.

From the time when many of the leading sheet mills and tin plate producing units were placed under the one management of the American Sheet & Tin Plate Co., about the same time the United States Steel Corp. was formed, Mr. Fuller has been located in Pittsburgh, though prior to 1901 he spent some time representing the company in both New York and Chicago.

In his new position he succeeds from the title of assistant general manager of sales, a post which he held for some time. J. I. Andrews, formerly vice president and general manager of sales for the company, continues as vice president in charge of sales.

Mr. Fuller resides in Pittsburgh. He has been a member of the American Iron and Steel institute since 1912.

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Paul W. Lyon, for a number of years associated with the tin plate division of the general sales department of American Sheet & Tin Plate Co., Pittsburgh, has been appointed assistant manager of the tin plate sales division of Wheeling Steel Corp., with headquarters at the company's general offices, Wheeling, W. Va.

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Harold B. Ressler, vice president in charge of sales of Joseph T. Ryerson & Son Inc., Chicago, will move to New York to take charge of the company's Jersey City, N. J., plant, following resignation of J. A. McNulty, former manager of this division. Mr. Ressler has been with the Ryerson company for 30 years, and prior to his moving to Chicago in 1929 was manager of the St. Louis plant for 15 years. He is also vice president of the American Steel Warehouse association.

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Jan R. Dunsford has been named chairman of the board of Union Steel Casting Co., Pittsburgh, subsidiary of Blaw-Knox Co. Frank Cordes is president, D. V. Sherlock manager, William P. McGervey Jr. assistant to the president, Robert H. Cunningham sales manager, Walter H. Eisenbeis assistant sales manager, John N. Critchlow and Grant W. Lillie sales representatives.

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Clarence A. Young, for years active in steel castings sales in the Pittsburgh district, is now associated with the sales department of the Machined Steel Casting Co., Alliance, O. With headquarters in Alliance, he will cover the Pittsburgh and Youngstown, O., districts in the sales of rolling mill equipment and other heavy steel castings. Previously he has been connected with the Lewis Foundry & Machine Co. and the Duquesne Steel Foundry Co., Pittsburgh.

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A. Ditson, formerly purchasing agent, Bridgeport Machine Co., Wichita, Kans., is now manager of the Tulsa, Okla., store of Hinderliter Tool Co., Tulsa.

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J. H. Greenland, formerly connected with the Iron Fireman Mfg. Co. branch at Cleveland, is now in charge of manufacturing at the Chain Products Co., Cleveland.

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Kirby Smith, formerly sales manager for J. H. McEvoy & Co., Houston, Tex., has been named sales manager for the Gulf Coast Machine & Supply Co., Beaumont, Tex.

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J. G. Bell has been appointed alloy steel sales representative for the Youngstown Sheet & Tube Co., at Cleveland. He has had a wide experience in this field.

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Arthur C. Steifel, Wheeling, W. Va., has been appointed a member of the executive commitee of Wheeling Steel Corp., to succeed the late Frank Work, of Steubenville, O.

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H. F. Ryan, formerly with the W-K-M Co., Houston, Tex., manufacturer of oil field equipment, is now district manager at Tulsa, Okla., for the Gardner-Denver Co., Quincy, Ill.

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J. C. McQuiston, secretary of the American Gear Manufacturers' association, Wilkinsburg, Pa., has been unanimously re-elected president of the Pittsburgh Goodwill Industries for 1934.

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W. J. Brown has been appointed district traffic manager for the Pittsburgh district of Bethlehem Steel Co., succeeding the late Alexander M. Hughes, to whom he was assistant for 18 years.

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S. H. Worrell, formerly associated with the Detroit Seamless Steel Tubes Co., is now affiliated with the Detroit office of the Pittsburgh Steel Co., Pittsburgh, in the sale of steel tubing and mechanical tubing.

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George K. Viall has been elected a director of the Chain Belt Co., Milwaukee, to succeed the late Clifford F. Messinger. He has been associated with the company since 1921, first as assistant to the president, then works

manager and more recently a vice president.

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J. Kent Boyd, for many years manager of the Wheeling Mfg. Co., Chattanooga, Tenn., has been named president of the Roane Iron & Coal Co., Chattanooga, new holding company for the Roane Iron Works, Rockwood, Tenn.

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A. B. Clark has been appointed general traffic manager of the operating companies of Union Carbide & Carbon Corp., New York, succeeding the late Herbert Thompson. Mr. Clark has been with the corporation 17 years.

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L. P. Niessen has been appointed advertising manager of Cutler-Hammer Inc., Milwaukee, to succeed Forrest U. Webster, who as noted in STEEL for Jan. 29, has been advanced

Arthur H. Young

Who as noted in STEEL for Feb. 5 has been appointed vice president in charge of industrial relations for the United States Steel Corp., New York

to manager of merchandising sales. President of the Milwaukee Association of Industrial Advertisers, Mr. Niessen has been assistant to Mr. Webster for the past five years.

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F. E. Harrell has been chosen assistant chief engineer of the Reliance Electric & Engineering Co., Cleveland. He has been with the company since 1924, specializing for a time in steel-mill motor applications.

J. L. Van Nort is now with the Chicago office of the company as a sales engineer, previously having been active in the New England and Cincinnati districts.

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Dr. L. C. Pan, technical director, United States Research Corp., Long Island City, N. Y., and instructor of electroplating in the City College of New York, has been elected a fellow of the American Association for Advancement of Science. Dr. Pan has been active in the development of plating control systems, a method for oxidizing and coloring aluminum, and a brightener for nickel plating.

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A. S. Hellstrom has been appointed by the Bantam Ball Bearing Co., South Bend, Ind., to represent it in the Youngstown, O., Cleveland and Wheeling, W. Va., districts. His headquarters will be at 1625 Ohio avenue, Youngstown. Identified for many years with engineering work on steel mill equipment, he recently returned from Siberia, where he assisted in the design and erection of a modern steel plant.

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Frank M. MacMillin has been elected president and general manager of the Hydraulic Press Mfg. Co., Mt. Gilead, O., succeeding Walter G. Tucker, son of the founder of the company, who has been advanced to chairman of the board. Mr. MacMillin has been engaged actively in the management of the company for 32 years, most of this time in the capacity of executive vice president. His son, Howard F. MacMillin, hitherto vice president in charge of sales, has been named vice president and assistant general manager. He has been connected with the company since 1921.

Died:

JAMES HARTNESS, 72, pioneer machine tool builder, designer and inventor, and retired president of the Jones & Lamson Machine Co., Springfield, Vt., at his home there, Feb. 3. Born in Schenectady, N. Y., his first connection with machine shops was in Cleveland, with the Younglove, Massey & Co. and the Union Steel Screw Works. Later he was toolmaker at the Lake Erie Iron Works and in 1882 went to Winsted, Conn., as foreman in the Thomson, Stacker Bolt Co. Successively he was connected with the Union Hardware Co., Torrington, Conn., Pratt & Whitney Co., Hartford, Conn., and the Eaton, Cole & Burnham Co., Bridgeport, Conn.

He entered the Jones & Lamson company in 1889 and was the first superintendent until 1893, manager until 1900, and president from then on, retiring last year. During this time he was one of the most influential designers of machine tools of this generation, owning over 100 patents, including a flat turret lathe, an automatic die, turret equatorial telescope, screw thread comparator, and others. He was indirectly responsible for the development of numerous well-known machine tools, such as the Fellows gear shaper, Gridley automatic lathe, the Lo-Swing lathe, the Bryant chucking grinder and the Fay automatic lathe. He was the sixty-first governor of Vermont, past president of the American Society of Mechanical Engineers and the author of several books. He was the father-in-law of Ralph E. Flanders, now president of the Jones & Lamson company.

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Guy Chase Myers, 52, first vice president, F. E. Myers & Bros. Co., Ashland, O., at his home there, Feb. 6.

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Harry C. Wilcox, 64, master mechanic, Pressed Steel Tank Co., Milwaukee, Feb. 5. He had been with the company 30 years.

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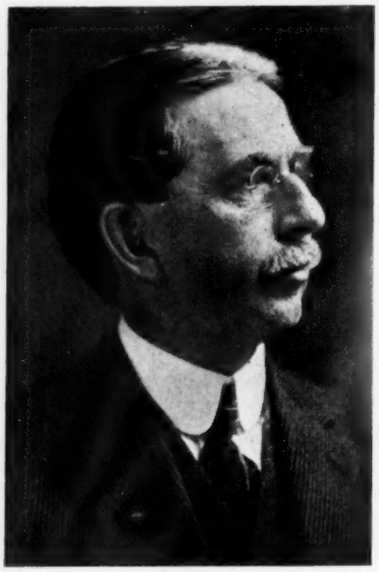
Luzerne S. Greene, 77, until his retirement in 1930 secretary and



James Hartness

treasurer of the Central Boiler Works, Detroit, in that city, Feb. 4.

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Arthur L. Wallace, 84, a former assistant paymaster, Jones & Laughlin Steel Corp., Pittsburgh, and later secretary and treasurer of the Iron City Sand Co., Pittsburgh, in that city, Feb. 7.

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D. W. Rich, manager of the Park work of Crucible Steel Co. of America, Pittsburgh, in that city Feb. 2. He was a veteran employe of Crucible Steel Co. and prior to 1930 had been superintendent of finishing mills at the Midland, Pa., works of Pittsburgh Crucible Steel Co., also a subsidiary of Crucible Steel Co. of America.

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John Lewis, 67, former employe of Carnegie Steel Co., Pittsburgh, and the Ft. Pitt Malleable Iron Works,

Pittsburgh, in Winter Haven, Fla., Jan. 31.

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Elmer C. Trautman, 30, inspector in the electrical department of Homestead steelworks of Carnegie Steel Co., in Pittsburgh, Jan. 31.

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E. J. Mohr, president of the Northern Illinois Foundrymen's association and vice president and general superintendent of the Gunite Corp., Rockford, Ill., Feb. 6, in Madison, Wis.

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Harry F. Hetzel, 65, ore agent for Jones & Laughlin Steel Corp., Pittsburgh, at his home in Bellevue, Pa., Feb. 1. Mr. Hetzel's affiliation with Jones & Laughlin covered the past 45 years.

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Robert S. Hall, 71, former sales manager and present secretary of the board of directors of the Struthers-Wells Co., Warren, Pa., at his home in that city recently, following a long illness.

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J. G. Hendrick, 58, general manager and secretary of the Shelby Iron Co., Shelby, Ala., in a Birmingham, Ala., hospital, Jan. 29, following injuries received in an automobile accident.

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James Baird, 86, one of the founders of the Baird-Slinger Foundry & Machine Co., Portage, Wis., Feb. 2. He retired 15 years ago, and the company now is known as the Slinger Foundry, Machine & Auto Co.

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Henry Baetz, 69, engineer and inventor, in St. Louis, Jan. 30. He was best known for his work in connection with the design and manufacture of heating systems. In 1898 he founded the St. Louis Blower & Heater Co., selling out his interests in 1914.

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E. O. Wattis, 77, president of Six Companies Inc,, Boulder City, Nev., builder of Boulder dam, in Ogden, Utah, Feb. 3. With his two brothers he was one of the founders of the Utah Construction Co., co-organizer of Six Companies Inc. He became president or the latter shortly after the death of W. A. Betchel a few months ago.

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Thomas G. Stewart, 54, from 1924 to 1931 foundry superintendent for the J. I. Case Co., Racine, Wis., in Tcheliabinsk, Siberia, Jan. 30. He went to Russia in 1931 to take charge of a tractor plant at Kharkov for the soviet government, later having been transferred to Tcheliabinsk to supervise the development of another tractor plant there.

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Edward H. Earnshaw, 70, former chief engineer of the gas department of the Public Service Electric & Gas Co. of New Jersey, and an authority on gas and steel problems, at his home in Orange, N. J., Feb. 1. Following his graduation from the University of Pennsylvania in 1883 he entered employ of the Bethlehem Steel Co. and subsequently managed blast furnaces in Pennsylvania and the South. He was a former director of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Depression Lifting For Ore Industry

OFFICIAL Lake Superior iron mine records for 1933, just compiled, reveal the industry has gone a long way in pulling out of its depression.

Not only were shipments more than six times as heavy as in 1932, but the number of properties from which ore was moved increased from 66 to 122. This shows substantial improvement, notwithstanding the fact considerable ore was shipped from stockpiles in the two years, and therefore did not represent new operations.

Further, the industry benefited by an increase in the proportion of iron ore used in making pig iron. In 1932 blast furnace operators scraped in every way to economize on raw materials. Their ore stocks on which money could be borrowed were conserved, and sintered flue dust and scrap made up a larger proportion of furnace mixtures. Only 1.4 tons of ore was consumed for each ton of pig iron produced.

In 1933 the proportion rose to 1.63, practically to the point of 1.64 as in 1931. Even this slight gain meant the added consumption of 2,429,000 tons of iron ore. In the preceding ten years the ratio ranged from 1.70 to 1.80 tons of ore per ton of pig iron. As soon as the iron and steel industry got out of its low phase of production the ratio jumped up, and presumably will continue to advance toward normal limitations.

In 1933 shipments amounted to 21,672,410 gross tons, whereas only 18,115,760 tons were consumed. This also is a turn toward normal balance, wherein mine shipments for a season generally exceed consumption in the same year.

In 1932 shipments were 3,588,608 tons; and consumption, 9,837,000. Though blast furnaces were using ore as sparingly as possible, it was more expedient to prevent the accumulation of stocks.

No new mines were opened in 1933. The United States Steel Corp.'s subsidiary, Oliver Iron Mining Co., shipped 8,501,504 tons—39.2 per cent of the total—varying only slightly from its proportion, 40 per cent, in 1932. The eight leading shippers accounted for 87 per cent of the ore, leaving the remainder to 13 others.

The Mesabi Iron Co.'s $5,000,000

(*Please turn to Page* 42)

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ORE TO SPOUT AGAIN IN 60 *DAYS: With northern lake ice conditions reported favorable, and new requirements this year estimated at* 35,000,000 *to* 40,000,000 *tons, the first iron ore vessels probably will be loaded in April. Last year when only* 21,672,410 *tons were shipped, they started early in that month. The maximum number in service was* 217, *of a fleet comprising* 330. *This year the number will be larger. Ore stocks at lower lake ports and furnaces Feb.* 1 *were* 33,000,000 *tons; by May* 1 *this likely will be reduced to* 25,000,000 *tons. Stocks still will be around* 5,000,000 *tons above normal, indicating a slow movement at first. The vessel shown is the* WILLIAM MCLAUCHLAN, *of the Interlake Steamship Co.'s fleet*

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EDITORIAL

To Abandon Price Principle Is To Kill Steel Code

ADOPTION by the Senate of the Borah resolution directing the federal trade commission to investigate the operation of the steel code is significant evidence of the suspicious and antagonistic attitude against industry which exists among many of the legislators of this nation.

To understand what is behind this movement, one must delve deeply into the tangled roots of political intrigue, bureaucratic jealousy, clashing industrial interests and the fanaticism of economic theorists. The activity of all of these forces is heightened by the emotional appeal of the "new deal," which to many individuals now in Washington is essentially a license to uproot, modify or destroy anything in industry which does not fit into their theoretical conception of the ideal economic state.

Senator Borah's initiative in attacking the price provisions of the steel code undoubtedly goes back to his well known belief that the full force of the anti-trust laws must be invoked to prevent price-fixing and monopoly. His staunch support of this view probably arises from his sincere belief that the trust laws protect the "small" business man.

His ire was aroused when certain NRA codes were approved with provisions for open-price systems. It was further excited when experience under the codes brought forth—largely through the consumers' advisory board—complaints that certain prices had increased sharply under NRA.

Commission, Complacent for Nine Years, Suddenly Condemns Multiple Basing Points

Meanwhile, the federal trade commission, some of whose members are credited with the ambition that it shall become the heir to the prerogatives of NRA, began to show signs of life. For nearly 10 years, following its Pittsburgh-plus decision of July 21, 1924, its silence as to the multiple basing point system employed in the steel industry has been accepted generally as evidence that the practice meets the requirements of that famous decision.

Now the commission suddenly has taken the stand that the multiple basing point plan is in direct violation of the Pittsburgh-plus decision. Just why the present system under NRA, which embraces basing points in 57 cities, violates the decision any more than did the system of 12 basing points which prevailed from 1924 to Aug. 19, 1933, is not explained by the commission. One of the commissioners airily waves aside that nine-year period with the statement that it is "water over the dam."

Simultaneously with these developments has been a guerilla warfare against NRA on the ground that it tends to oppress "small business" and to favor the large corporations. Many of these attacks are traceable to politicians, who, finding cases of inequalities under codes, magnify them and distort them so as to create the impression that the operators of small shops are placed at a serious disadvantage by NRA.

Add to these various complaints the constant bickering of college professors, agitators and other theorists, and you have the principal elements of the attack which is being launched against the steel industry and its code of fair competition.

Explaining Good Features of Open-Price System Is Best Counter-Offensive

What shall the steel industry do to meet this broadside?

We believe that the situation calls for a campaign of education as to the motives and objectives of the present price system. The existing system is so far ahead of anything that has gone before that it should not be difficult to convince any reasonable person of its merits.

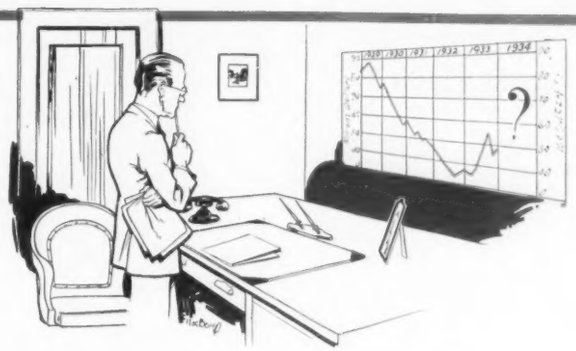
Much of the resentment against it can be traced to two factors: First, lack of familiarity with it and, second, prejudice engendered by reports of injustices arising from price provisions of the code.

Everyone knows that experience under the steel code has brought to light numerous inequalities. Many of them already have been corrected by means of commercial resolutions. Others are being ironed out as rapidly as possible.

The broad issue is whether steel producers and consumers will be permitted to work out the present system satisfactorily or whether the great advances afforded by NRA must be sacrificed on the altar of political expediency, bureaucratic jealousy and radical fanaticism.

The job of makers and buyers of steel is to "sell" the open-price system so thoroughly—to explain its merits so convincingly—that the opposition will be forced to beat a retreat. If the open-price principle and the basing point system are eliminated, the steel code will be of little value to anybody.

THE BUSINESS TREND



Delay in U. S. Projects May Bring Peak Load in Spring

TODAYS situation in business affords a good illustration of the importance of timing in the control of government activities which involve the release of orders to industry.

The idea of stimulating railroad buying of steel through federal aid was broached last summer. Bickering over price was settled by the President on Oct 30. Months passed without definite action and only recently has the program resulted in actual awards for material in important volume. Similar delays have occurred in many PWA projects. On United States navy work, orders and jobs are being held up because specifications are not ready.

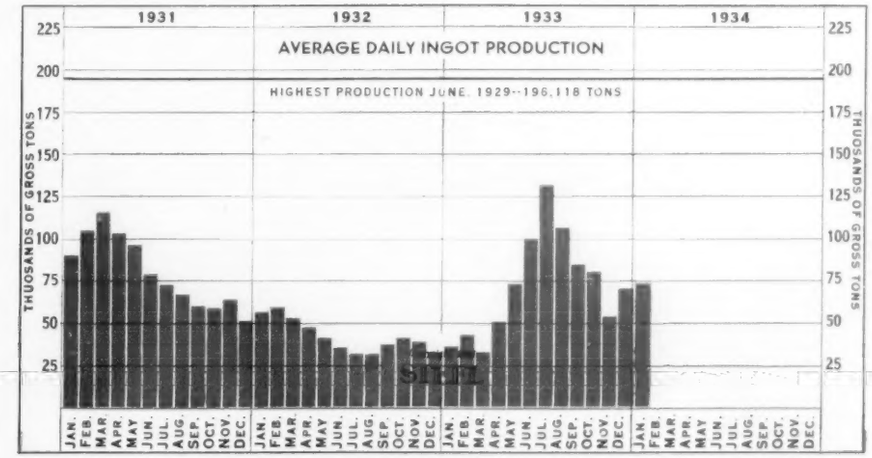
One result of these delays will be that much of the government-sponsored work will be thrown upon the industry at an inopportune time. Some of the projects should have been ready last November and December. Had they been awarded then, industry could have bridged the year-end quiet period with more activity.

As things now stand, there is a strong likelihood that government work and considerable equipment rehabilitation will "break" at about the time when the mounting curve of automobile production reaches its peak. Better timing of the artificial work, which is controllable by the government, would have distributed the business more evenly.

Weekly barometers show that the pace of industrial activity is quickening. Steelworks operations again are moving upward positively. Freight car loadings and electric power output continue to gain moderately. Even more significant are the signs of a resumption of plant equipment modernization and replacement. Another encouraging factor is that the purchases of plates and shapes for railroad car building will help the mills which turn out heavy steel products. These mills have lagged far behind the light products mills and their activity is essential to well balanced production in the industry.

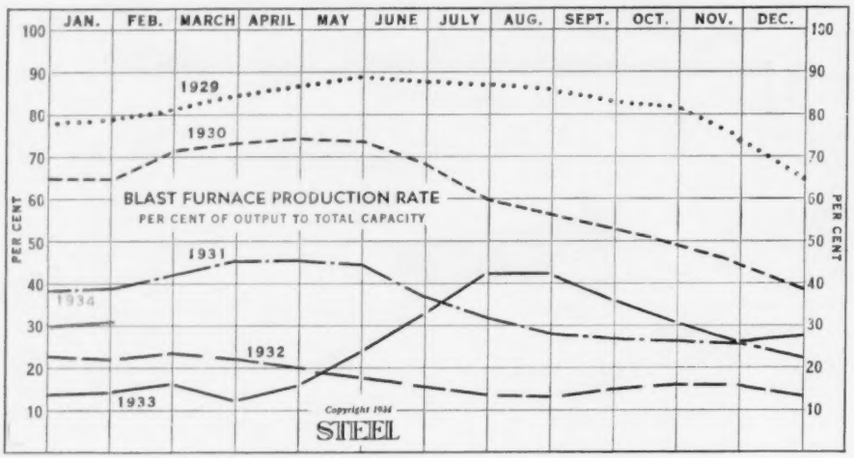
Disorders in France and Central Europe May Affect U. S. Monetary Policies

Trouble in Europe may influence the American monetary policy, particularly in the method of employing the stabilization fund. Should France abandon gold, the international relationship of money would undergo another adjustment. The effect upon American recovery is not yet clear.



1934	
Jan.	73,959
1933	
Dec.	72,786
Nov.	59,264
Oct.	81,226

1933	
Jan.	39,618
1932	
Dec.	33,117
Nov.	39,701
Oct.	41,810



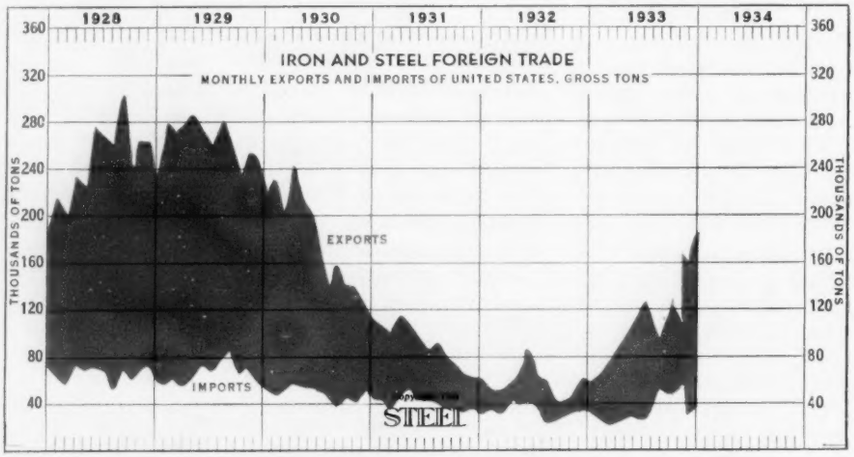
	Per Cent
January, 1934	28.6
December, 1933	27.9
January, 1933	13.3

86 Blast Furnaces Active At End of January

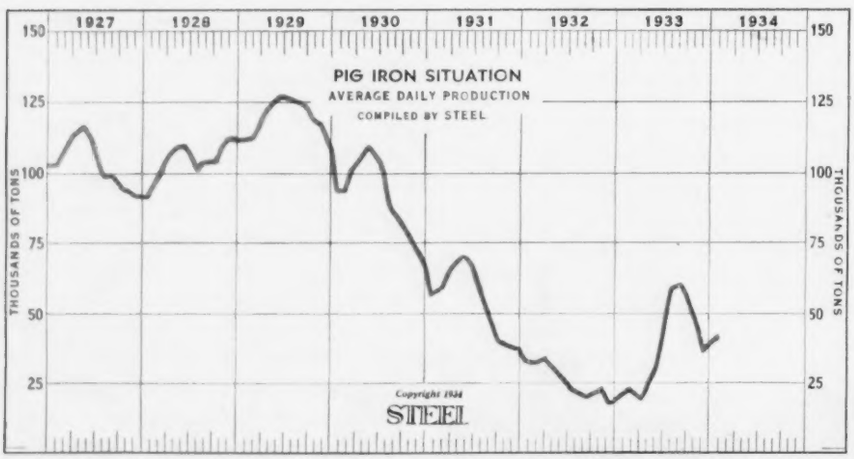
Although the January output of pig iron, aggregating 1,222,214 tons, gained only 2.52 per cent over the previous month, there was an increase of 12 furnaces to the active list. On the last day of January there were 86 furnaces producing iron against 74 on Dec. 31 and only 45 were blowing at the close of January, 1932. Relating production to capacity, the operating rate for January was 28.6 per cent, against 27.9 in December and 13.3 in January, 1933.

December Steel Exports Highest Since May, 1930

Iron and steel exports of the United States in 1933, at 1,350,692 gross tons, exceeded those of 1932 by 756,042 tons or 126 per cent. In December exports of iron and steel products totaled 184,585 gross tons, the largest volume since May, 1930. This exceeded the total for November by 26,985 tons and compares with 54,137 tons shipped in December, 1932. Imports in 1933 were 414,790 gross tons, which is approximately 10 per cent greater than the total for 1932.



Exports	Tons	Imports	Tons
December, 1933	184,585	December, 1933	31,310
November, 1933	157,600	November, 1933	28,979
December, 1932	54,137	December, 1932	29,390



January, 1934	39,426
December, 1933	38,456
January, 1933	18,348

January Iron Production Gains 2.5 Per Cent

The average daily output of coke pig iron in the United States for January was 39,426 gross tons, which compared with the 38,456-ton rate of December was an increase of 970 tons, or 2.52 per cent. This was the largest daily rate since last October with 43,824 tons, and the best January since 1931, when the daily output stood at 55,337 tons. The January, 1933, daily rate was 18,348 tons and in January, 1932, it was 31,336 tons.

Improves Quality of Centrifugally Cast Pipe

BY B. K. PRICE
Associate Editor, STEEL

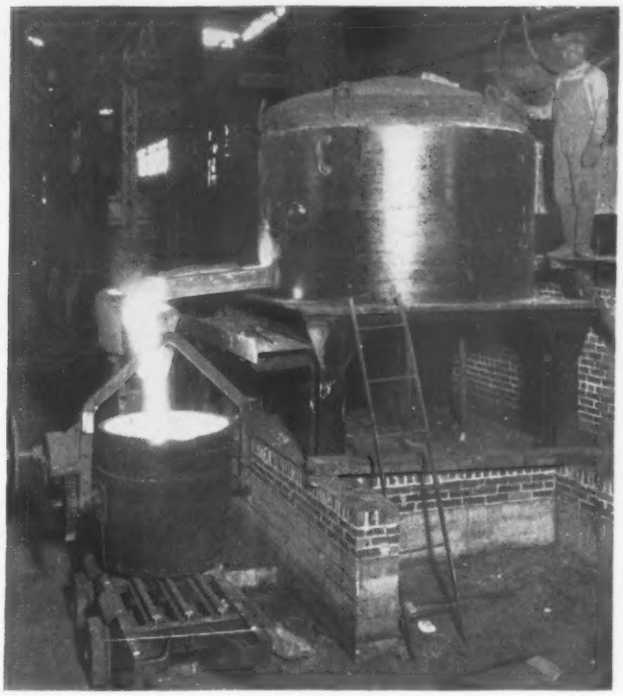


Fig. 1—One of the two 108-inch cupolas which were rebuilt and provided with forehearths to permit better conditioning of the iron for centrifugal pipe casting

UNCHILLED cast iron in metal molds has become not only an accomplished but a tested fact, with certain of the more essential details in the processing of this iron now being revealed for the first time. Interestingly, this development has embodied but one additional step in the casting of the iron, and without delay in the routine, but it is a step which has required many months of study, painstaking care and experimentation.

The achievement is that of the United States Pipe & Foundry Co., Burlington, N. J., in connection with the further refinement of its centrifugally cast De Lavaud iron pipe, a refinement that found its inception back in 1930, when the company, despite conditions of depression, decided to build and equip a research laboratory for studying added improvements in the production of its pipe.

Today, as a result of its endeavor, the company is able to point, among the major advantages of its new pipe, to an increase of more than 100 per cent in impact resistance, greater ductility and toughness, easier cutting and tapping, greater carrying capacity and lower cost per foot installed—a truly super deLavaud pipe, as it is now known.

The key to this improvement—the nonchilling of the iron—is the application of a pulver-

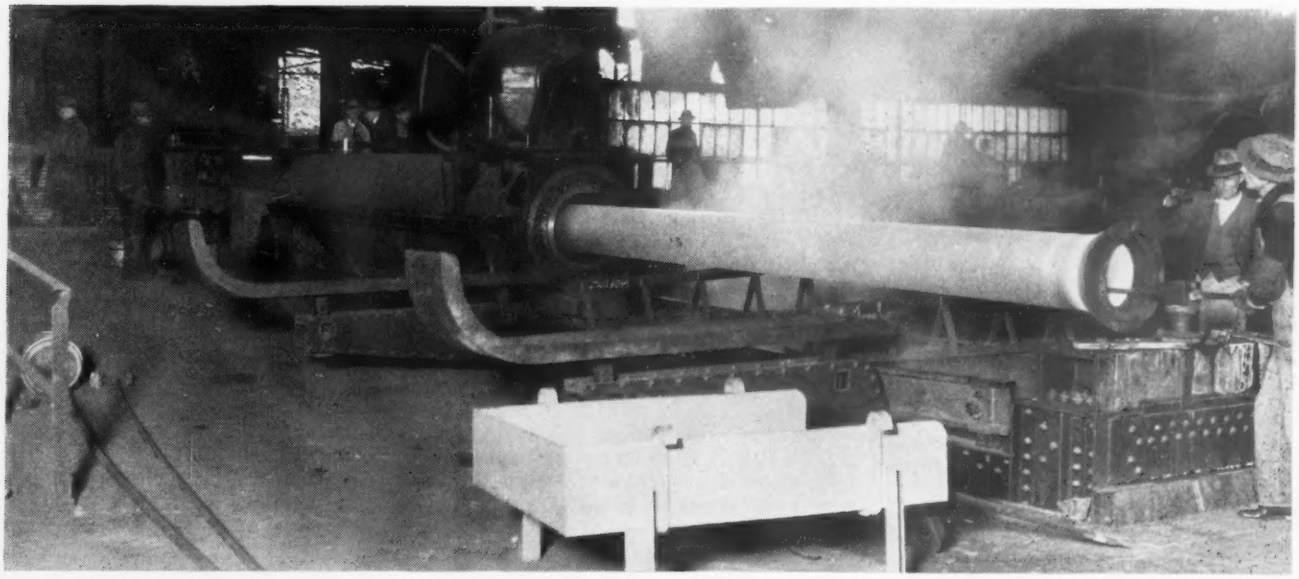


Fig. 2—Here is shown an 18-foot section of centrifugally cast pipe being drawn from the mold. When free from the machine, it will be carried by crane to the annealing furnace

ulent material with a carrier gas, onto the surface of the metal mold immediately preceding contact of the iron stream. The pulverulent material is sufficient to retard the heat abstraction from the molten metal to the mold long enough to prevent formation of chill.

The feeding device is operated by a small electric motor with a built-in gear reduction unit, over which is mounted a stationary vertical cylinder, approximately 15 inches high, 4 inches in inside diameter. On the bottom of the cylinder is a rotary disk, in the center of which is mounted an agitator. The disk and agitator cause the column of powder to rotate as a unit, and with each revolution, a knife located inside the cylinder pares off a constant amount of powder, which is fed into an atomizing gun.

Sprayed Over Mold Face

Here the powder is picked up by a carrier gas stream, in which the powder becomes suspended. The powder is then carried through a spray lance, or conduit, on the end of which is a distributor nozzle, which changes the direction of flow and distributes the powder and carrier gas over the face of the rotating mold.

The nozzle, about 6 inches long, is a perforated hollow cone, and is attached to the trough of the casting machine over which the mold moves. The length of the nozzle is so proportioned that the entire interior surface of the mold is coated uniformly with the layer of powder and absorbed gas.

The development of the process came after innumerable experiments both with regard to insulating materials and manner of application. In the case of the above mentioned nozzle alone, 157 types were tried out before deciding upon the present pattern.

Liquid Washes First Tried

Experimentation first started with liquid washes, but this retarded production, for in each case a certain delay was necessary while the liquid dried. Sometimes, too, the wash would burn into the mold. Then various dry powders were tried, but the method of application proved difficult. The salt shaker method did not give even distribution, nor was it possible to distribute the powder lightly enough. Further, it also slowed up the operation. Hence, it was necessary to center considerable attention on means of conveying the powder before a satisfactory method was developed.

While the annealing is much the same, it was found advantageous with the unchilled pipe to reduce the temperature and to allow the pipe to remain in the oven slightly longer than under previous practice.

The basic metallurgical change, which eliminated the chilling of the pipe, and this improvement in annealing technique has been standard practice in the centrifugal pipe units of the company for more than a year, with protective patents here and abroad. Incidentally, it may be recalled that the United States Pipe & Foundry Co. acquired sole manufacturing and sales rights in the United States for the deLavaud patented process for centrifugal casting in 1922. The original process was fully described in IRON TRADE REVIEW, predecessor of STEEL, issue of Sept. 27, 1923.

Coincident with public announcement of the improved process is the initial operation of a super deLavaud unit at the Bessemer, Ala., works.

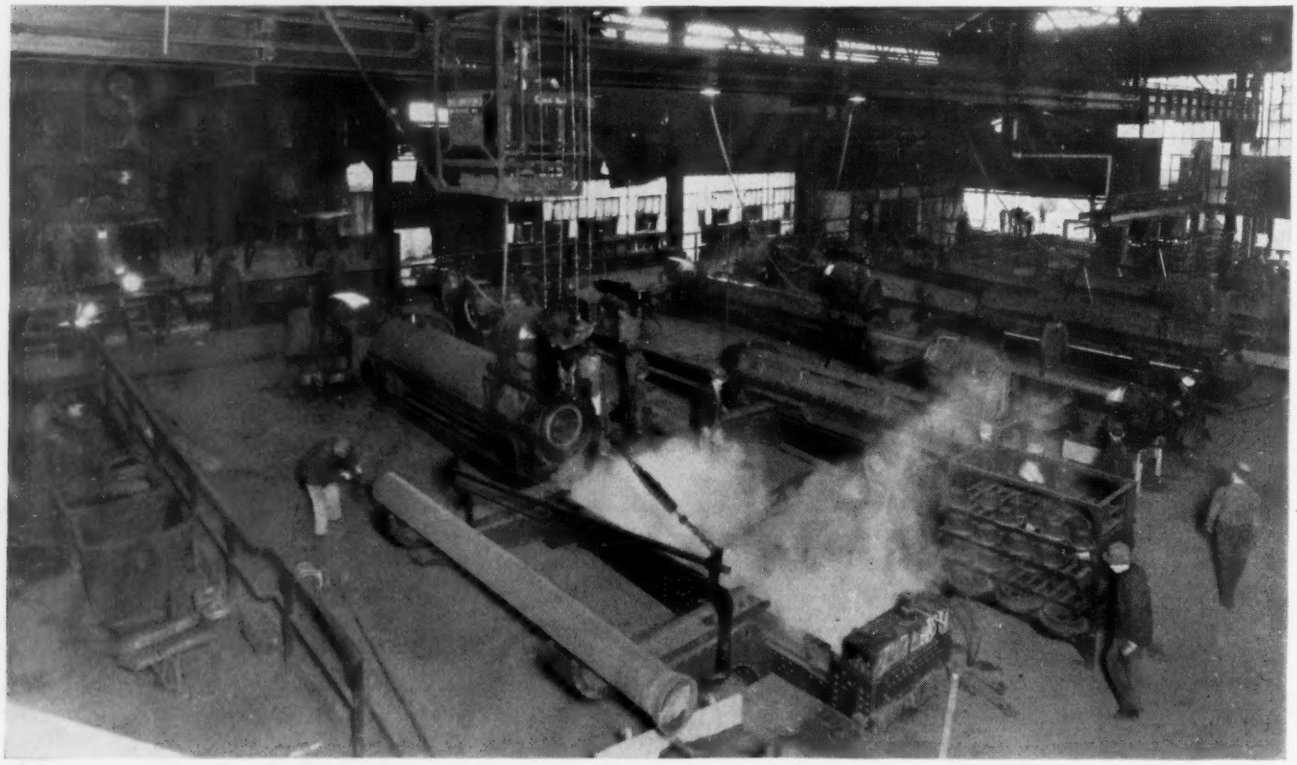


Fig. 3—A general view of the new centrifugal pipe casting unit in the Bessemer, Ala., works of the United States Pipe & Foundry Co. It consists of four 4 to 12-inch and one 14 to 24-inch machines for producing pipe in 18-foot laying lengths

This unit replaces a portion of a sand cast pipe turntable shop originally built in 1915, and consists of four 4 to 12-inch and one 14 to 24-inch super deLavaud machines for the manufacture of pipe with 18-foot laying length. A general view of the operating floor is shown in Fig. 3.

Piping Below Floor Level

The machines are supported on a rugged operating floor and under this floor is a basement of unusual height, which permitted housing of all of the piping systems—air, steam, low and high-pressure water and afforded excellent access to all parts of the five super deLavaud machines.

For furnishing the necessary iron, two 108-inch cupolas, originally used for sand cast operation, have been rebuilt and provided with a forehearth, illustrated in Fig. 1, to bet-

ter condition the iron for the purpose intended.

Iron from the forehearth is passed directly into the pouring ladles. These ladles are conveyed to the respective super deLavaud machines by means of an overhead traveling crane, the runway of which was an added piece of construction in the remodeling of the shop. This crane spans half the width of the building—the other half being spanned by a similar crane. This latter crane is used in taking the pipe, after being cast, as illustrated in Fig. 4, to the charging end of the annealing furnace. Fig. 2 shows the pipe being drawn from the mold and Fig. 5 the pipe entering the annealing furnace.

Handling of Sockets

The sockets are made of sand and are used in the super deLavaud machines for forming the bell end of the pipe. A complete socket core system is located at the end of the unit and includes ovens, sand handling equipment, blacking tables, etc. The sockets after being rammed at the tables are blackened and placed upon trays. They are then transported by an electric lift truck to the ovens where they are baked, and subsequently transported to the side of the super deLavaud machine, ready for use.

A modern annealing furnace, with necessary appurtenances, has been installed in a new building, in close proximity to the super deLavaud machines. To obtain this desired location it was necessary to raze a portion of the original structure. To accurately record the weight of all pipe cast, a scale is installed directly preceding the annealing furnace. The furnace is operated with gas as its fuel and is actuated through a system of thermocouples automatically, so that the variation in temperature at no time exceeds 20 degrees Fahr.

From the annealing furnace, the pipe, moving in straight line production, passes through the various operations of cleaning, coating and testing, for which the most improved equipment has been installed. After weighing, the pipe is transported to the storage yard or loaded for immediate shipment, as desired.

Since considerable water is used in the operation of the unit, a recirculating system has been installed, which consists of a large pond equipped with spray nozzles, so that the water in the summer time can be cooled readily. This system is capable of distributing water at either low or high pressures, according to requirements.

The annealing furnace and core ovens were constructed by the R. & S. Products Co., Philadelphia. Structural steel was supplied by the Virginia Bridge & Iron Works, Roanoke, Va. Cast-iron roof plates, a new product of the United States Pipe & Foundry Co., were used in roofing the new unit. The engineering department of the company designed the unit and supervised the general construction.

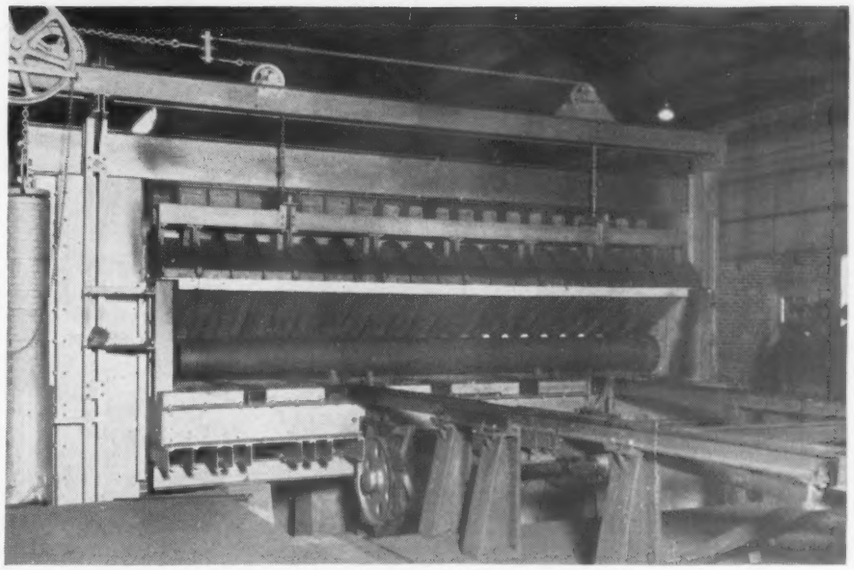


Fig. 5—A section of pipe entering the annealing furnace. Unchilled pipe is annealed at a somewhat lower temperature but remains in the furnace for a slightly longer period than in previous practice

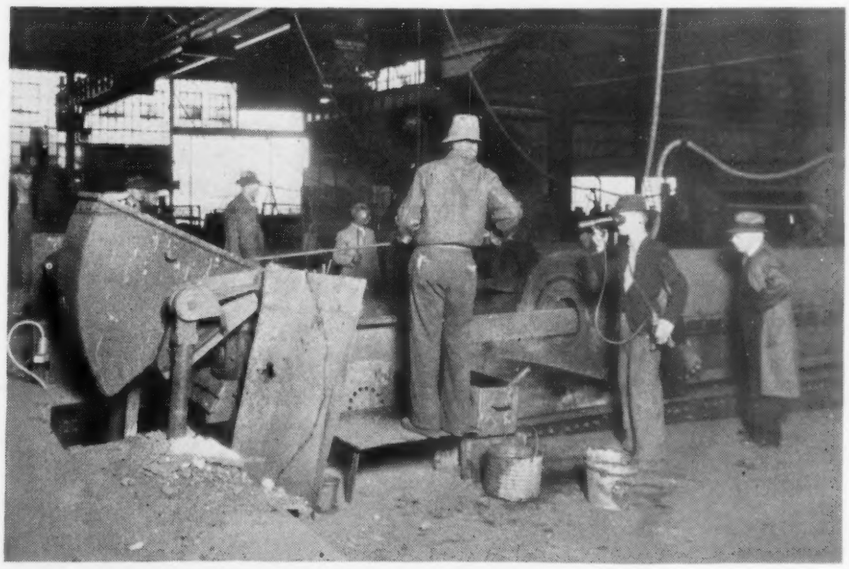


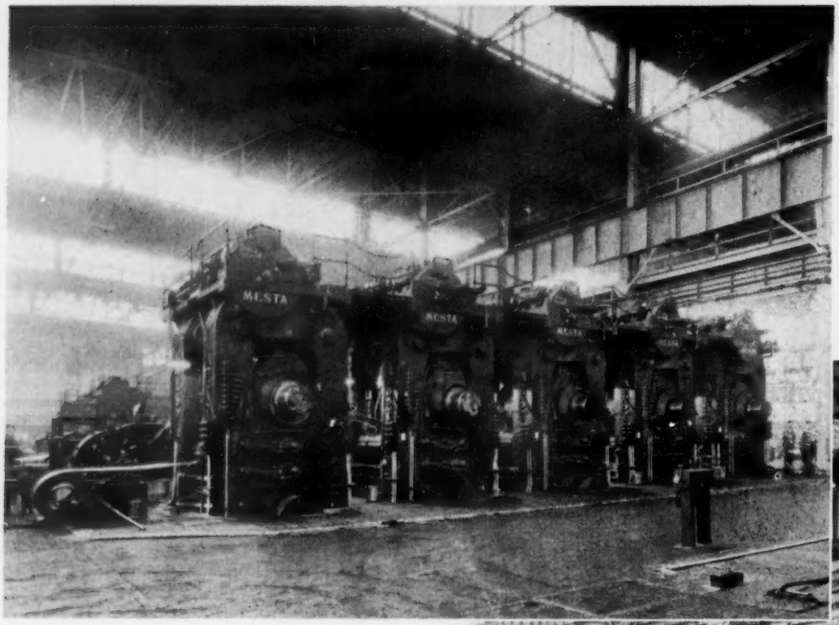
Fig. 4—Here is shown the casting end of a super deLavaud centrifugal pipe machine. The method of introducing the iron into the revolving mold is indicated clearly

Cites Advantages of Steel Floors in Housing Projects

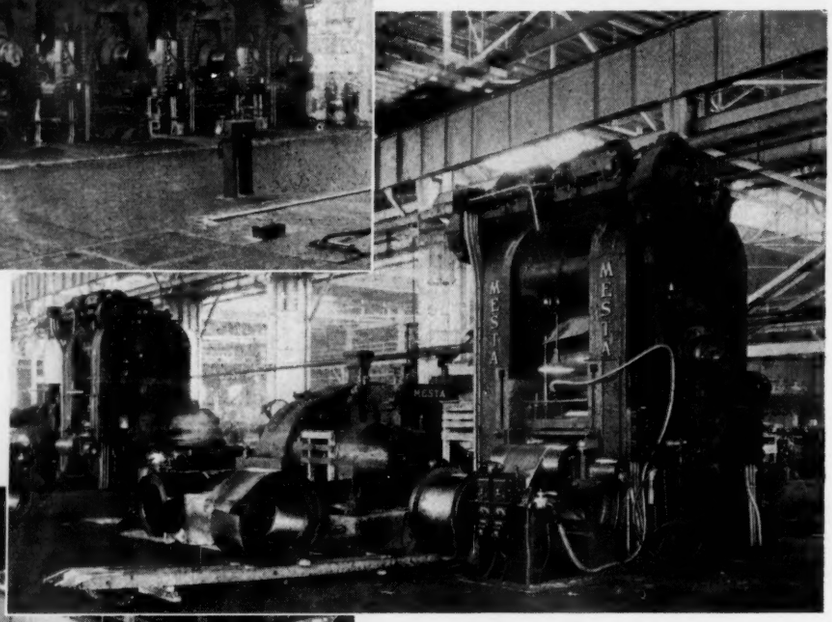
Application of the keystone-beam steel floor, manufactured by the H. H. Robertson Co., Pittsburgh, in apartments and low-cost housing projects, is reviewed in a 12-page pamphlet recently issued by that company. This type of floor, developed under auspices of the Mellon Institute of Industrial Research, comprises prefabricated sections, each taking the form of four cellular beams, fabricated from sheet steel and spot welded to a flat backing plate.

Technical Progress Outlined

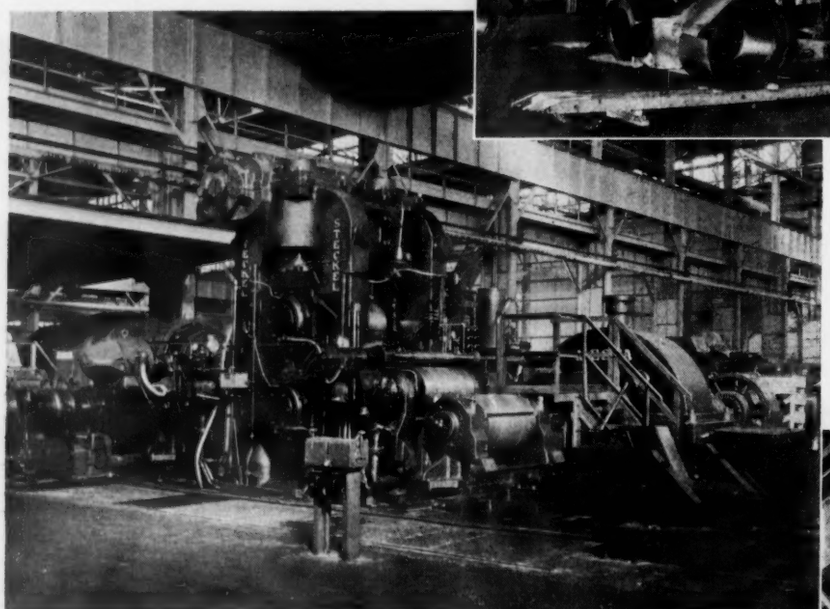
Engineering achievements of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., during 1933 have been compiled by H. W. Reding in booklet form, copies of which are available from the company. Replete with illustrations, the 36-page booklet delineates progress made in nearly all fields, including materials handling, welding, steel, electric heating, air conditioning, radio, transportation and many others.



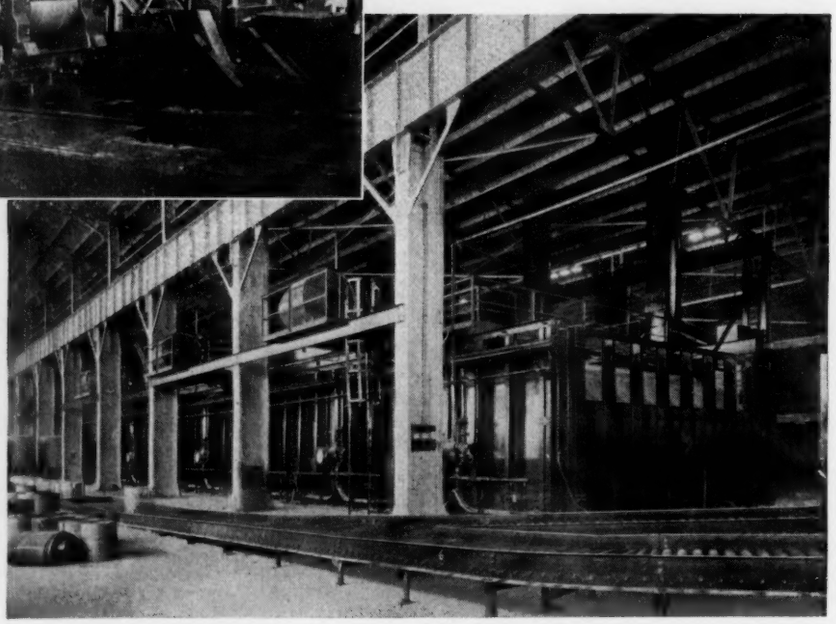
FIVE-STAND tandem cold mill for production of black plate from hot rolled strip. This mill, equipped with devices to insure accuracy of gage, reduces 16-gage strip to 38-gage black plate 36 inches wide



TWO of the 4-high type mills employed for skin rolling strip steel in annealed form. Following this operation the product is trimmed and sheared into black plate of specified length and width



FOUR-HIGH mill with nondriven working rolls. The product is pulled back and forth between the rolls by power-driven reels installed on either side of the mill until the desired thickness is obtained



GENERAL view of annealing department. Here coils, free from all traces of oil, are piled 2-high on bottoms, covered, sealed and subjected to the annealing operation before being skin rolled

Chicago Steelmaker Operates New Tin Mill Equipment

MANY tin plate producers recently have installed mills of the 4-high type for the rolling of black plate in strip form. Some of these mills are built with non-driven working rolls, the strip being pulled back and forth by power-driven reels until the desired thickness is obtained; others are built with both the working rolls and reels driven. In either case heavy reductions per pass are possible. Following cold reduction, the product is sheared into standard short lengths, white annealed, white pickled and tin coated.

One of the latest companies to engage in the manufacture of tin plate is the Inland Steel Co., Indiana Harbor, Ind. where two mills recently have been installed. The first consists of a train of five exceptionally heavy stands of rolls through which hot rolled strip passes successively and is reduced to the desired gage. This mill is capable of rolling strip 36 inches wide to 38 gage, or 55-pound tin plate.

Builds Wide Strip Mill

In 1931, the Inland company built a large continuous hot strip mill for the production of flat and coiled strip and plates. This mill, described in the March 28, 1932, issue of STEEL, is capable of rolling plates up to 72 inches wide, stamping it as the widest hot strip mill in the world as far as known. At the same time this mill was laid down, a cold rolling department was built, complete with the necessary continuous pickling equipment. In this cold rolling division the hot rolled product is reduced to the desired gage by a series of cold mills arranged in tandem, after which the material is cut to sheet lengths, annealed and finished. This unit produces cold rolled sheets principally for the automotive industry.

Devices Promote Accuracy

The 5-stand mill recently built for the rolling of black plate for tinning is of heavy construction and is provided with ample power to effect the necessary reductions in this wide material. Many devices are provided also to insure accuracy of gage of the finished material. The mill is designed so that the maximum delivery speed may be as high as 700 feet a minute.

In addition to this train, the company also has installed a 38-inch Steckel mill principally for the purpose of producing light-weight material. In this type of mill, as is well known, the hot rolled band is pulled back and forth between the rolls a number of times until the desired reduction has been obtained. The working rolls are not driven, power being supplied by the reels on either side of the mill applying tension to the material. It is anticipated that the capacity of these two units will afford the production of 10,000 tons of cold rolled black plate per month.

After the hot rolled bands have been reduced to the desired gage in the cold rolling department, they are transferred to a separate building where further processing is carried out. The first step is to thoroughly free the cold rolled bands of all traces of oil. This is accomplished in an electrolytic cleaning device.

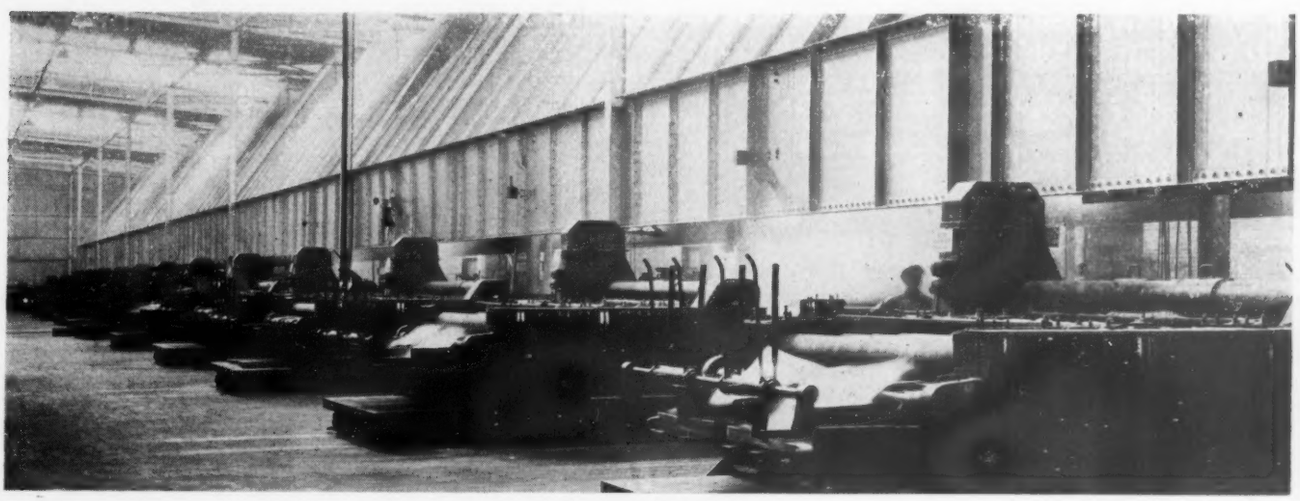
When the coils have been cleaned thoroughly and dried they are annealed in a series of furnaces. The coils generally are mounted 2-high on the annealing bottoms and covered by a circular alloy cover, properly sealed to prevent air from having access to the coils during the annealing period. After the coils are annealed, they are transferred to a coil cooling building where they are allowed to cool until reaching room temperature. As the coils are required for further processing, they are transferred to the skin rolling mills by tractors.

These skin rolling mills are of the heavy 4-high type, and are designed to allow any degree of cold rolling that is required to give the necessary temper to the black plate. From these cold rolling mills the material passes into the trimming and flying shears where it is trimmed to width and cut to length at a rate of approximately 300 feet per minute. The cold rolled bands are now in the form of black plate of the size required to fulfill customer's order.

In this form the individual sheets are inspected and sorted to eliminate any off weights or defective material. They are then ready for the tinning operation, which is similar to the process used in other tin mills. They are given a white pickle immediately prior to tinning, and stored in boshes, from which they are transferred to the tinning machines. The other operations in the production of tin plate are the same as practiced in other plants.

Flame Cutting Widens Scope Of Welded Fabrication

How machine gas cutting of metals brings about greater strength with less weight, greater latitude in design and speeding up of production sched-



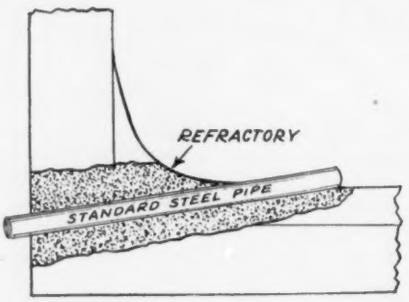
Interior of tin house. Tin pots, installed along right side of building, are served by cleaning machines which handle two plates simultaneously

ules is told in a new booklet, *Machine Gas Cutting*, issued by the Air Reduction Sales Co., 60 East Forty-second street, New York, available to any reader of STEEL upon request to this company. Machine cutting of shapes by oxyacetylene flame has enlarged considerably the scope of welded steel fabrication, a fact which is brought out forcibly by the numerous instances described and illustrated in this booklet. Primarily this has been possible through the development of a number of different types of cutting machines, designated by such names as radiagraph, camograph, omnigraph, tramograph, oxygraph and travograph—all designed by the Air Reduction company for some special type of cutting work, from the lightest gage steel plate to slabs, forgings and castings approaching 30 inches in thickness. These machines and their method of operation are described in detail, and illustrations of the units in operation are shown.

Chrome-Base Castable Refractory Shows Merit in Steel Heating Furnaces

FOR building monolithic bottoms in forging, bolt and nut, bar, plate, angle, strip, billet, tube and other steel heating furnaces, a new chrome-base castable refractory has been developed, and is claimed to be showing unusual qualities in respect to resisting abrasion, slag penetration and spalling.

Known as Hearth-Crete, this material was mentioned briefly in the review of progress in refractories during 1933, presented on page 132 of the Jan. 1 issue of STEEL. A product of the Quigley Co. Inc., 56 West Forty-fifth street, New York, it is supplied to the user in dry granular form and is mixed with water on the job to a stiff, plastic consistency. It is then put into place in the furnace hearth, or into suitable forms, leveled off and troweled smooth. It sets quickly at room temperature and can be put under heat in 4 to 24 hours, depending upon the size of the job. No burning-in is required.



In reforming the taphole of an open-hearth furnace, this arrangement is used, the pipe melting out after the furnace has been placed in operation

Accompaning sketches illustrate two typical applications. One is in the bottom of a strip mill furnace; the other for reforming an open-hearth furnace taphole.

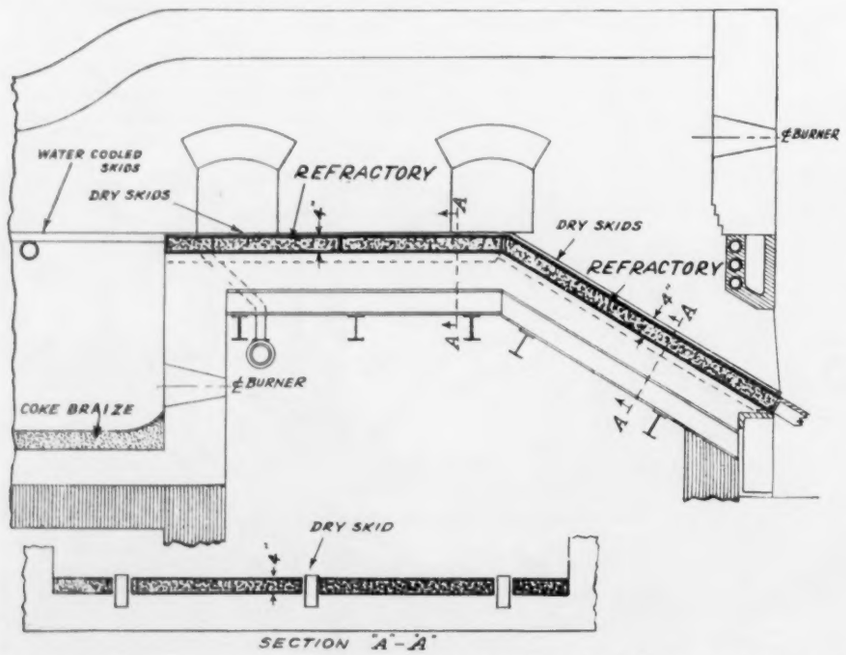
Advantages of chrome refractories in point of longer life, resistance to abrasion and slagging action, and production of cleaner heated steel have become generally recognized. In addition to these advantages, this new refractory possesses other worthwhile features, including high chemical and mechanical stability at operating temperatures and, as mentioned previously, ease of installation.

Labor Cost Is Low

To illustrate this latter factor, a hearth 61 feet long by 3 feet 3 inches wide in an angle heating furnace at a large shipyard was installed in 2 hours, and at a labor cost of $9.92.

Because of its ease of handling, many plants are said to be using the material for casting burner blocks and other special shapes. Where a grooved hearth is employed in a furnace, the desired shape can be formed readily by pressing a length of pipe into the refractory before it sets, thus forming the grooves.

The material is shipped to the user in 175-pound bags.



Indicating how new chrome-base castable refractory is laid up in bottom of strip mill furnace

Revised Data and Prices on Ball Bearings Issued

Ninth edition of a ball bearing catalog containing dimensions, load data, mounting designs, factors for the selection of bearings at electric motor speeds, factors for selecting bearings for speeds down to 10 revolutions per minute, fits and weights for all bearings and a telegraphic code for ordering and giving shipping instructions, has been issued by the New Departure Mfg. Co., Bristol, Conn.

The 128-page catalog is completely indexed for quick reference to any section. New list prices, additional sizes of existing types of bearings and several new bearing types are other features.

Gives Cutting Oil Facts

Socony-Vacuum Corp., 26 Broadway, New York, is distributing a 40-page booklet on "Lubricants and Coolants for Metal Cutting," containing a wealth of information on this subject. Discussed in various divisions of the publication are fundamentals of cutting, various types of cutting operations, metals and recommendations, types of cutting oils offered by the company, and S. A. E. numbers for various steels.

Attached to the back cover is a convenient folding chart listing lubricants and coolants for a wide range of cutting operations. The text is illustrated with many sketches.

The Plastic Forming Of Metals

By PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part II—Forces and Flow of Material in Technical Forming Processes

6. Force Required for Extrusion (Continued)

HORIZONTAL curves should be expected in indirect extrusion, wholly without regard to the nature of the chamber wall; because the compressed body remains at rest and no wall friction can occur. As is seen in Fig. 90, this is indeed the case when smaller reductions of area are produced. With increasing values of the ratio between initial and final area, however, the exerted force increases during the extrusion process, and even more, the higher the area ratio is. This phenomenon is attributed to the fact that, depending upon the magnitude of pressure exerted, a thicker or thinner lead film is squeezed out between the chamber wall and the moving die plate, by reason of which large frictional losses occur.

Pressure Not Included

In the case of the numerical evaluation of the curves, this increase of the pressure was not considered, because it is attributed to external influences. The idealized curves (dotted) also were plotted in some parts of the illustration. In this case a somewhat higher force is required at the beginning of extrusion, and an appreciable diminution of the force is observed toward the end of the extrusion process, as soon as the die plate has approached to within about a third of the inside diameter of the chamber from the base. The force increases again at the end, in a similar manner and for the same reason as previously described for direct extrusion.

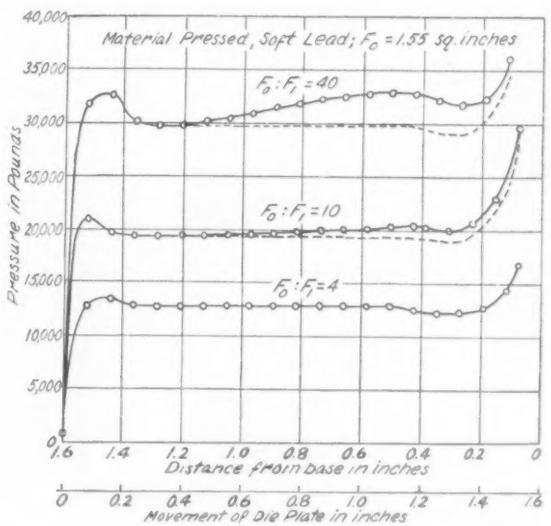


Fig. 90—Influence of area ratio on variation of force in indirect extrusion

Inasmuch as the wall friction in direct extrusion vanishes almost completely toward the end of the process, the forces required for the pure forming in this process must correspond approximately to the smallest values of the forces exerted by the ram, which occur at the beginning of the described increase toward the end of the test. From these values, the deformation resistance can be calculated according to equation (26); although the fact should be considered that an additional loss of force, due to the friction produced on the face plate, is to be expected.

Data Are Tabulated

In Table VIII this calculation is carried out for both extrusion processes, with the use of the test results represented in Figs. 88 and 90. The deformation resistance of load in the extrusion process accordingly is found to be 5120 to 6690 pounds per square inch. If the extraordinarily large variety of reductions of area in the tests is considered, the agreement between the values of deformation resistance, which are calculated for the various test conditions, must appear remarkably close. The tests accordingly show that the theory derived for the numerical treatment of the extrusion process is useful, and that it permits the determination of the pressing forces for dies of various shapes, as soon as data are available

Table VIII

Extrusion Tests with Lead Bodies

1 Diameter	2	3 Area	4	5	6	7	8	9	10	11
Chamber D_o inches	Die D_1 inches	Chamber F_o square inches	Bar F_1 square inches	Area ratio $\frac{F_o}{F_1}$	Deformation $\log_e \frac{F_o}{F_1}$ per cent	Displaced area $F_o \log_e \frac{F_o}{F_1}$ square inches	Pressing force* P pounds	Deformation resistance K_f pounds square inches	Pressing speed v inches minimum	Type of extrusion
1.405	0.220	1.55	0.0388	40	369	5.72	29,000	5120	0.197	Direct (Fig. 88)
1.405	.....	1.55	0.0388	40	369	5.72	28,670	4980	0.197	Indirect (Fig. 90)
1.405	0.449	1.55	0.155	10	230	3.57	18,150	5120	0.197	Direct (Fig. 88)
1.405	.....	1.55	0.155	10	230	3.57	16,270	4550	0.0315	Indirect (Fig. 93)
1.405	.....	1.55	0.155	10	230	3.57	18,700	5260	0.197	Indirect (Figs. 90, 93)
1.405	.....	1.55	0.155	10	230	3.57	20,820	5830	1.574	Indirect (Fig. 93)
1.405	0.701	1.55	0.388	4	139	2.15	12,190	5690	0.197	Direct (Fig. 88)
1.405	.....	1.55	0.388	4	139	2.15	12,090	5550	0.197	Indirect (Fig. 90)
1.405	0.992	1.55	0.775	2	69	1.07	7,170	6690	0.197	Direct (Fig. 88)

*Minimum values, observed toward end of test; in indirect extrusion the corresponding values were taken from idealized curves (compare Fig. 90).

regarding the deformation resistance of the compressed materials.

Wall Friction Not Considered

In the direct extrusion tests described hitherto. the influence of wall friction was not indicated; for the reason that the frictional forces were small, due to the careful polishing of the chamber wall. In practical operation, such favorable relations cannot be achieved. Comparative tests therefore were carried out in which the material was compressed in a chamber with rougher walls. In test series A the walls of the chamber were only smoothturned, in test series B they were turned and filed, and in test series C they were ground. The results of the tests are shown diagrammatically in Fig. 91. As should be expected, the force at the beginning of extrusion is the higher, the

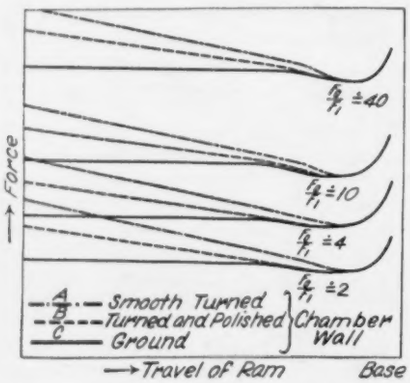


Fig. 91—Effect of nature of chamber wall upon variation of force in direct extrusion

rougher the wall of the chamber is made. Nevertheless, toward the end of the extrusion process, the forces in all cases drop to nearly the same minimum value. Now, however, the maximum forces on the ram in direct extrusion exceed by far those produced in indirect extrusion.

The manner in which the extrusion force, and therewith the resistance to deformation of the material, are altered when extrusion dies of various shapes are used for a given cross-sectional area of the extruded bar, is established as follows: Corresponding indirect extrusion tests were carried out with dies of 0.155 square inch area, of which the fillet radius varied between 0.04 and 0.20 inch (Fig. 92). Further extrusion tests were carried out with a die of 0.155-square inch area, at one time with the rounded edge of 0.04-inch radius on the forward side of the die turned toward the ram, and at another time with the conical rear side of the die turned toward the ram. Although a smaller force was observed with a larger die-fillet in the former tests, the force in the tests with the die reversed is shown in this case to exceed, by from 20 to 30 per cent, the results obtained with dies of ordinary shape. In comparison to this, a small but distinct decrease of the compressive force was observed with the use of a die having an opening angle of 120 degrees and a fillet of 0.04-inch radius at the edge (Fig. 92).

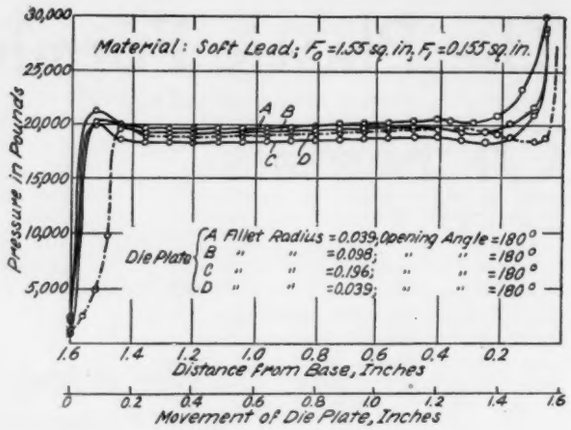

Material: Soft Lead; F_0=1.55 sq. in, F_1=0.155 sq. in.
Pressure in Pounds
30,000
25,000
20,000
15,000
10,000
5,000
A B
C D
Die Plate
A Fillet Radius =0.039, Opening Angle =180°
B " " =0.098; " " =180°
C " " =0.196; " " =180°
D " " =0.039; " " =180°
1.6 1.4 1.2 1.0 0.8 0.6 0.4 0.2
Distance from Base, Inches
0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6
Movement of Die Plate, Inches

Fig. 92—Effect of shape of die on variation of force in indirect extrusion

Requires Increased Force

When a die plate with four circular openings, each of 0.039-square inch area, was used instead of a plate with a single circular opening of 0.155-square inch area, so that equal total area of openings was provided, the force on the ram required to carry out the extrusion process was increased about 4410 pounds. However the force still remained considerably smaller than the force produced in the operation with a single opening of 0.039-square inch area. Appreciable savings of deformation energy therefore can be achieved by the application of more than one die opening.

Further tests were conducted to study the influence of the pressing speed upon the variation of force. In Fig. 93 indirect extrusion tests are represented for comparison, which were carried out with a die area of 0.155-square inch, and with pressing speeds of 0.31, 0.197 and 1.57 inches per minute respectively. The course of deformation was not fundamentally altered by increasing the pressing speed to five times its minimum value. The forces, however, assume values about 15 per cent larger or smaller than those observed with the normal test speed of 0.197-inch per minute, as a result of increasing or decreasing the pressing speed. Accordingly, although the effect of the varying speed of pressing can be established clearly, it nevertheless is contained between comparatively narrow limits.

One effect of the pressing speed, however, is distinctly noticeable in another phenomenon. A disadvantage of the indirect extrusion process arises from the fact that it produces a rougher surface on the bar than is produced in direct extrusion. In the foregoing tests with various speeds of pressing, the outer surface of the extruded bar appeared scarred at lower speed, rough and dull at higher speed, and smooth and brilliant at the highest speed. It accordingly appears that the disadvantage attributed to indirect extrusion might be overcome by increasing the pressing speed.

Applicable to Alloys

The fact that the fundamental laws, which were derived in the beginning and confirmed in small scale tests, can be carried over also to the hot extrusion of brass alloys, is shown in tests by W. Eisbein and G.

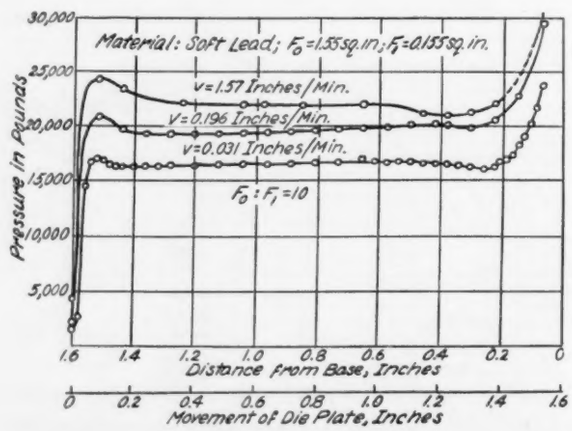
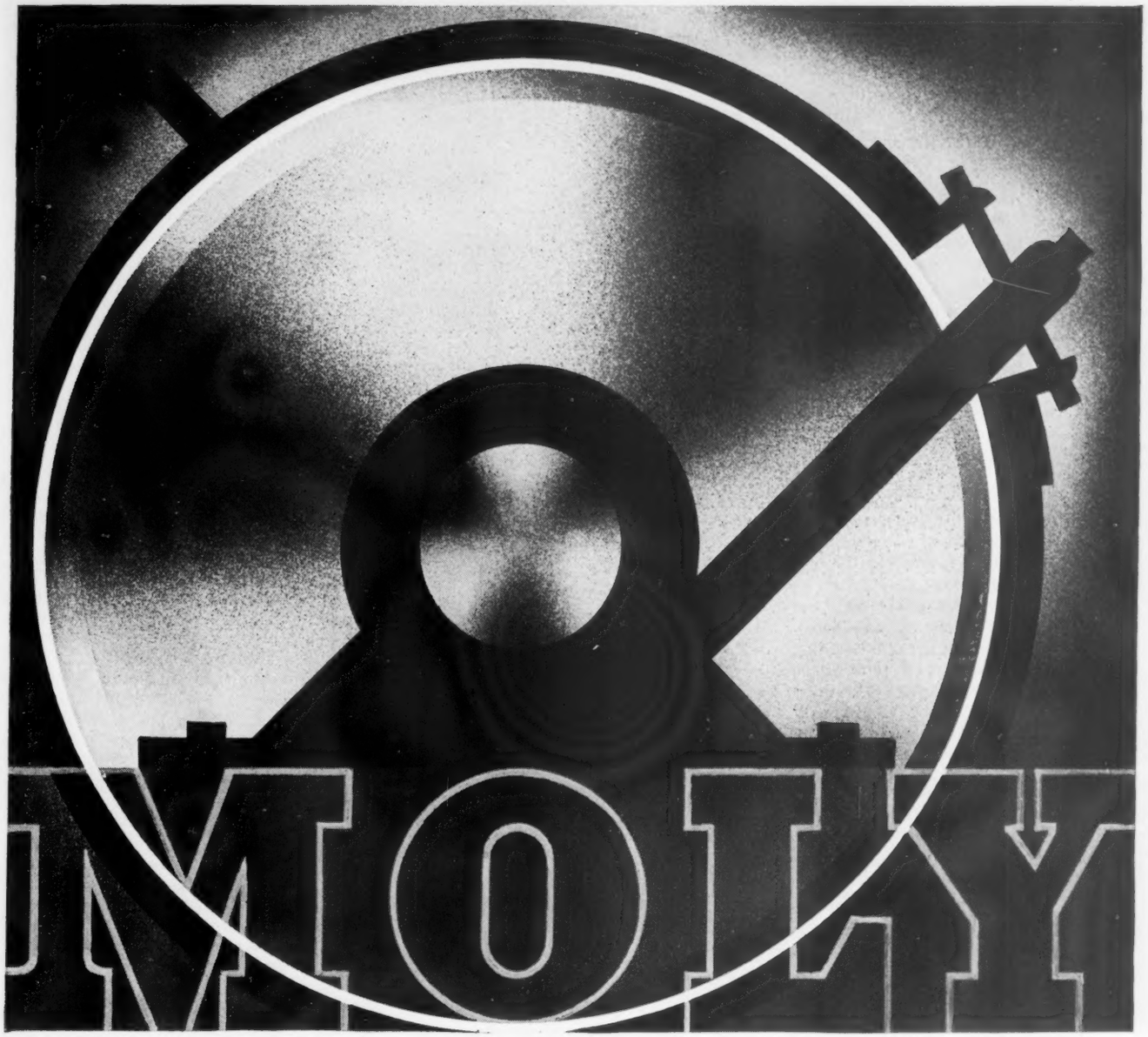


Fig. 93—Effect of pressing speed on variation of force in indirect extrusion



for wear . . .

GREEK meets Greek when two wearing surfaces engage each other under vise-like pressure and heavy opposing forces. The brakes on traveling cranes and other hoisting machinery furnish an example. Based on replacement costs, it is usually the drum, and not the band lining, which comes out second-best. This is true not only with ordinary carbon steel but even with most alloy-steels and irons.

It's a different story when Molybdenum is added. Under *any* formula it improves wear-resisting ferrous products. Molybdenum imparts a hardness — without brittleness — obtainable with no other combination of alloys at a competitive cost. *Comparative service tests have shown Molybdenum grey iron outlasting the usual steel drum three times with no appreciable wear as yet.* The depth hardness imparted by Moly to iron has made this application possible by affording sufficient strength to withstand the enormous torsional load.

Evidence in another field shows one automobile manufacturer doubling the life of brake drums with the addition of only 0.20% Molybdenum. . . . And what is true of one form of application is true of others — be they brake drums, cast steel dipper teeth, flat machine bearings or what-not.

Wear resistance is only one of the many desirable qualities of iron and steel which thousands of service tests have demonstrated can be improved with Molybdenum. Have you a problem of equipment upkeep involving wear; torsional, vibrational or sheering stresses; creep, growth or heat resistance? The modern Climax laboratories in Detroit, with their free engineering service, are at your disposal. Meantime, write for our latest book on Molybdenum. Climax Molybdenum Company, 295 Madison Avenue, New York City.

CLIMAX Mo-lyb-den-um

Sachs[69] on a 1000-ton press, in which billets of 6.69 inches diameter of extruded brass were extruded directly at various temperatures and pressing speeds, as well as with various reductions of area. The variation of the compressive force for 1202 degrees Fahr. billet temperature, and with a die of 1.97 inches diameter, is reproduced in Fig. 94 in relation to the travel of the ram and the pressing speed, v. The effect of the pressing speed is noticeable, only at the beginning of extrusion, by a lowering of the compressive force at low speeds. This is based upon the fact that a greater cooling of the billet occurs during extrusion, the more slowly the extrusion proceeds; so that, with slow extrusion, the deformation resistance increases toward the end of the stroke of the ram.

Effect Is Insignificant

In extrusion with a feed exceeding 9.4 feet per minute, however, the temperature effect is practically negligible. With a pressing speed of 9.4 feet per minute the highest compressive force is produced at the beginning of extrusion, and is about 610 tons, whereas only 312 tons is required for the forming at the end of the extrusion process. From the latter value, the deformation resistance of the extruded brass, according to equation (26), is found to be 79,600 pounds per square inch. The coefficient of friction μ', since the compressive force decreases by about 298 tons in a travel of the ram of 23.6 inches then can be calculated according to equation (46) as:

$$\mu' = \frac{P' - P}{U \times l \times K_f} = \frac{657{,}000}{\pi \times 669 \times 23.6 \times 79{,}600} = 0.16$$

The dependence of the force requirement upon the area ratio, as it was observed in the tests at 1202 degrees Fahr. and at a pressing velocity of 2.36 to 2.76 inches per second, is shown in Fig. 95. In this case also, the reduction of force which is characteristic of direct extrusion, and which is apparent even with small deformations, is shown throughout.

[69] W. Eisbein and G. Sachs: Kraftbedarf und Fleissvorgange beim Strangpressen, Spanlose Formung der Metalle; J. Springer Berlin 1931; Z. V. d. I. 76(1932)p.49.

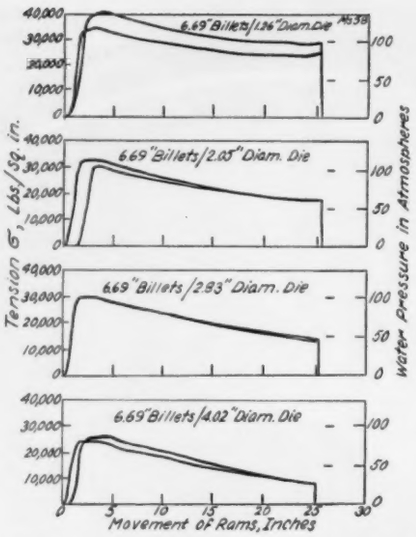


Fig. 95—Extrusion diagram for hard brass (Ms 58) at 1202 degrees Fahr. Influence of area ratio on variation of force (accordingto G. Sachs)

If the deformation resistance in this case is calculated according to equation (26), from the compressive forces at the termination of the extrusion process, giving consideration to the various magnitudes of deformation; the deformation resistance is found to vary only from 8000 to 8600 pounds per square inch in spite of the great differences in the reduction of area. The coefficient of friction, μ', calculated from the decrease of force, is found not to be entirely constant in this case; on the contrary, it increases from 0.1 with the use of a die having 2.05 inches diameter, to 0.13 to 0.16 when heavier sections were produced. The result is probably affected here also by the phenomena of cooling.

Results Are Erroneous

Whereas it was possible in the drawing process to determine the stress distribution in the die with close approximation from the requirement of force, such a calculation leads to no result in the case of extrusion. The shape and extent of the forming zone are not definitely determined in this case, as they are in drawing. The deformation begins rather at a considerable distance from the die; the course of deformation, as already has been established by the work of H. E. Tresca[2], A. V. Obermayer[3], P. J. Schweissguth[67], F. Dorinckel and J. Trockels[70], W. Schmidt[71], H. Unkel[68], and more recently by W. Eisbein and G. Sachs[69], is extraordinarily complicated. As is shown in Part III, extensive conclusions regarding the stress distribution in the region of deformation can be drawn from the experimentally-established course of deformation. By this means, it is found that a sort of arch construction occurs over the die opening, through which the transverse stresses required for piercing are produced.

(To be continued)

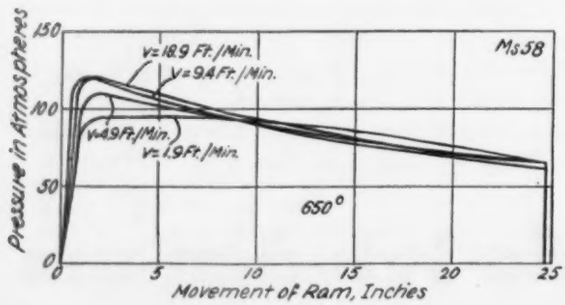


Fig. 94—Extrusion diagram for hard brass (Ms 58) at 1202 degrees Fahr. Effect of pressing speed on variation of force (according to G. Sachs)

Aluminum for Alloying Is Available in New Form

Aluminum to be added to molten metal baths for deoxidizing of alloying purposes is being offered in a new form by the United States Reduction Co., East Chicago, Ind. The aluminum is furnished in pieces which are star-shaped in plan view and have the appearance of large-toothed pinions. Individual teeth are equivalent in size and exposed area to the units of straight notched bars used for many years.

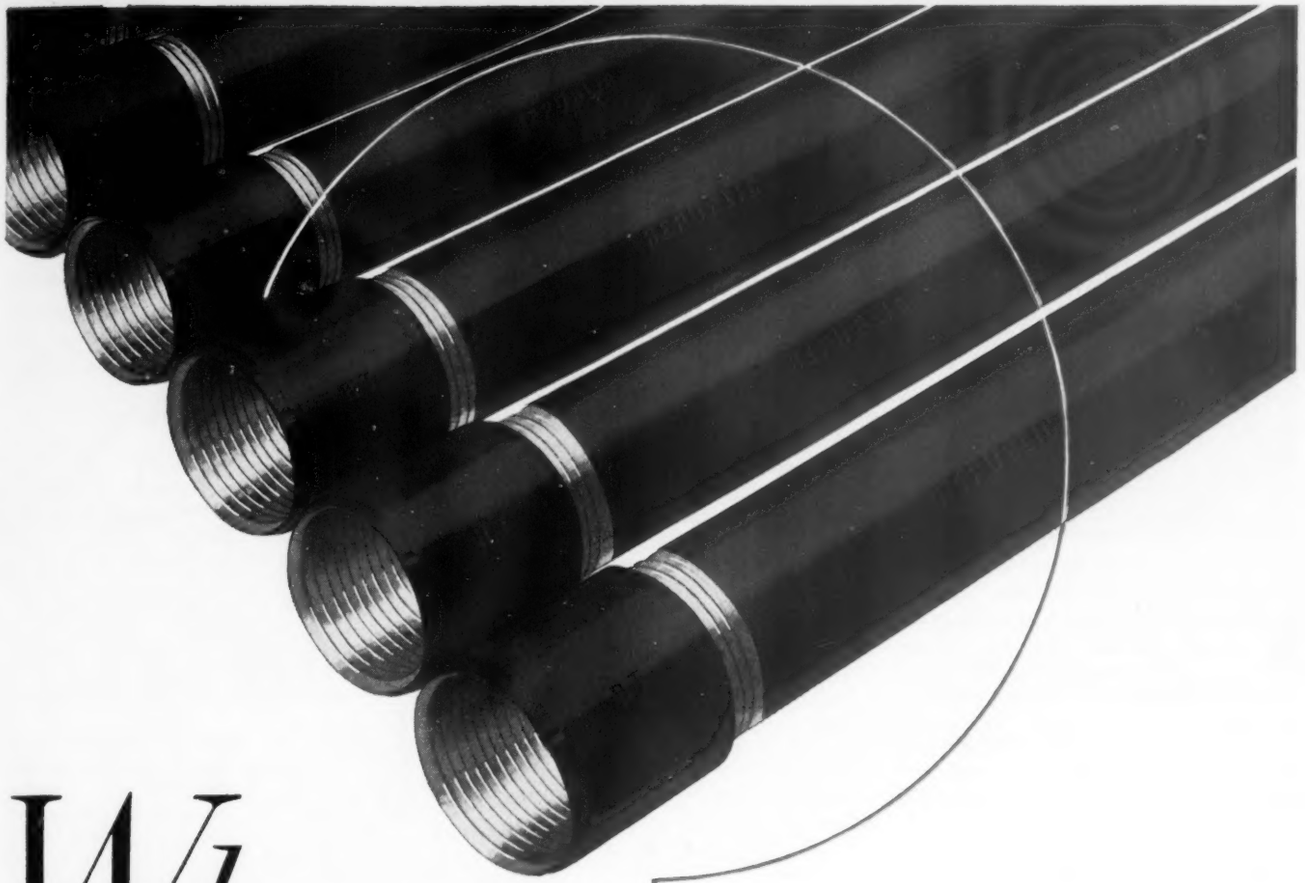
Notched bars commonly are attached to the end of a stirring rod by means of a heavy steel wire and submerged into the bath. The new design, however, has a hole in the center of the casting, permitting the piece to fit snugly around the stirring rod. The radial thickness of the hub is so proportioned to the bulk of the teeth that the latter cannot become detached from the assembly except by melting off progressively from the outside toward the center. Notched aluminum bars may become separated from the stirring rod before melting and, rising to the surface, have little influence on the bath.

The star-shaped castings offer a large effective area for quick solution in the molten steel. Users of aluminum in this new form report greater uniformity in results and economy in amount of metal required. The castings are supplied in various thicknesses but with standard diameters so that 2, 3 or 5-pound units may be assembled.

Gas or oil furnaces for heating drill steel are described in an 8-page bulletin recently issued by the Sullivan Machinery Co., 400 North Michigan avenue, Chicago. Sizes, weights, capacities and instructions for use are summarized.

[70] F. Dornickel and J. Trockels: Fliessvorgange im Messingblock beim Strangpressen; Z. Metallk. 13(1921) p.466.

[71] W. Schmidt: Das Pressen von Stangen aus Elektronmetall; Z. Metallk. 19(1927)p.378.



What price HOMOGENEITY

In the course of a year, Republic salesmen are many times asked the question, "Why should we pay a premium for Toncan Iron Pipe?"

The answers, "Because it lasts longer," and "Because it is worth it for economy reasons," are true, but there's a better answer.

The premium you pay for Toncan Iron is the price you pay for homogeneity—perfect uniformity. Toncan Iron is an alloy of refined iron, copper and molybdenum—and please don't confuse it with copper-bearing steel. To make such an alloy requires experience, more expensive materials and costly time. Severe specifications control the material charged into the open hearth. The refining of the iron and the addition of the copper and molybdenum at the right time are real accomplishments. Skilled ingot practice prevents the segregation of the metalloids and the inclusion of foreign solids and gases. And here is the result—an alloy that is homogeneous—in which every portion of the metal is the same throughout and equally resistant to rust—a resistance that is surpassed among the ferrous metals only by the stainless irons and steels.

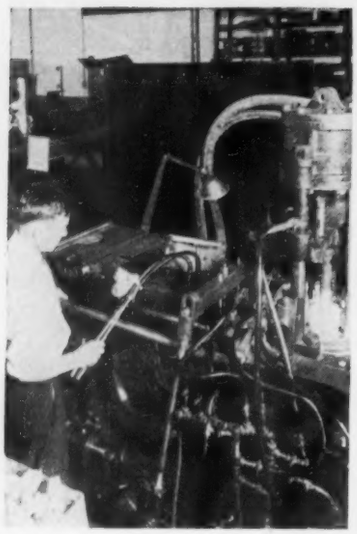
That briefly is the real answer to the question—"Why should we pay more for Toncan Iron Pipe," and after a trial in service has proved its economy, its real worth is quickly apparent.

Write for a copy of the new edition of "Pipe for Permanence."

TONCAN COPPER MO-LYB-DEN-UM IRON PIPE

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO



Making the Most *of* METHODS AND MATERIALS

REPORTS received from users of nickel cast-iron dies frequently are so spectacular as to be almost incredible. For example, a manufacturer of steel brake drums reports 40,000 stampings without redressing on heat treated cast-iron dies containing 3.50 per cent nickel and 0.50 per cent chromium, as compared with 300 to 500 stampings from dies produced from the conventional gray cast iron. Another manufacturer cold stamping auto truck body standards from 0.10-inch steel already has obtained more than a million pieces from a nickel cast-iron die, whereas the average production from the cast steel dies formerly used was approximately 500,000 stampings.

$ $ $

A recent series of tests of welded steel floors, including five fire tests and one loading test, have resulted in a number of improvements in design and details of construction, which are applicable to other similar types of floors as well as the one tested.

$ $ $

A large automobile tire company recently completed a resale store in a large Middle West city. The exterior of the building is finished in porcelain enamel, glazed brick and stainless steel, carrying much the same style as buildings at the Century of Progress exposition.

$ $ $

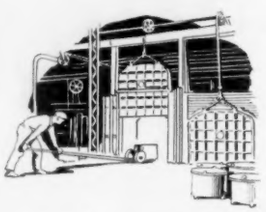
TO PROTECT workmen from sparks, gases and smoke when spot welding work which may have oil on it, a midwestern manufacturing plant has equipped its automatic welding machines with suitable guards. A frame containing a glass shield is mounted on each machine in such a manner as to prevent sparks from striking the operator's face and to make it unnecessary for him to wear goggles. Further protection sometimes is provided by suspending from this shield an apron made from canvas or leather. This prevents sparks from falling on clothing and causing serious burns. Fumes, smoke and many of the sparks are removed through a pipe ventilator connected to an exhaust fan.

$ $ $

In place of hard, 3-cornered steel files, formerly used for drilling holes in glass, drills made of tungsten carbide now are being employed on an increasing scale. The tungsten carbide tool is not triangular but is specially designed for cutting the glass.

$ $ $

The nitriding process is being applied economically to gray iron castings requiring extremely high wear resistance. In a recent symposium on



cast iron, it was stated that low total carbon, chromium, aluminum irons originally were developed for nitriding purposes. It is claimed that chromium-vanadium irons also respond to nitriding treatment satisfactorily. Nickel is used in nitriding irons to increase strength and toughness.

$ $ $

By application of powdered metallurgy, alloys have been made for welding contacts, die and cutting tools and self-lubricating bearings.

$ $ $

The S. S. MIKULA, said to be the largest and most powerful ice-breaking boat in the world, used by the Canadian government for keeping the St. Lawrence channel open during winter months, has four detachable steel blades which weigh 5800 pounds each. These blades were cast from a steel containing 0.32 carbon, 0.75 manganese and 3.35 per cent nickel, and the castings were treated to produce the following average properties: Ultimate tensile strength, 86,250 pounds per square inch; elastic limit, 58,575 pounds per square inch; elongation in 2 inches, 32 per cent; and reduction of area, 47.7 per cent. The toughness of the material is responsible for the excellent records which these and similar blades have made in service involving stress and impact at low temperatures.

$ $ $

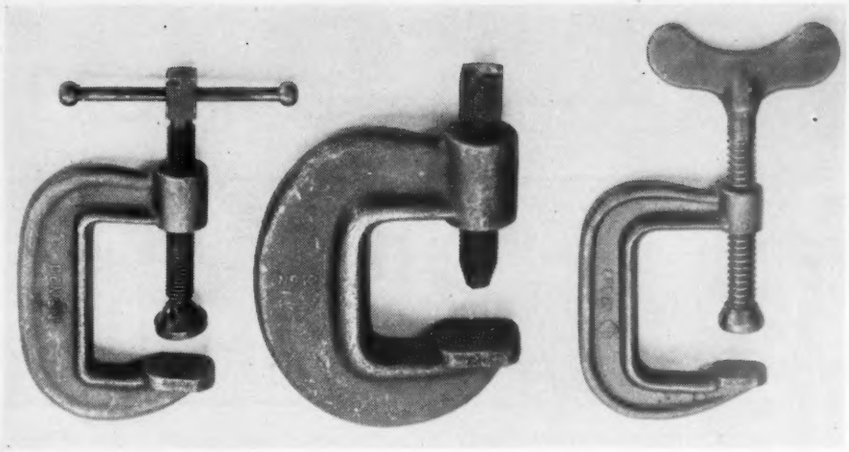
EXPOSURE tests of electroplated steel specimens were started in six locations more than a year ago to determine the protective value of such coatings. Inspections at regular intervals have shown that the thickness of the coatings is the most important factor in their protective value. Accelerated tests were found useful for predicting roughly the behavior of coatings under severe conditions of exposure, but they did not detect minor differences.

$ $ $

A method to treat molten iron and steel, particularly iron, so that it is refined and deoxidized recently has been patented. It consists essentially of passing the molten metal through a column of granular, carbonaceous material which is heated through an electric current. The column is enclosed in an airtight refractory chamber, except for the top layer, and it is claimed that only a slight oxidation occurs in that layer. The carbonaceous material may be graphite or coke, and with the latter the sulphur pick-up is extremely low

$ $ $

The rate of metal-to-metal wear of eutectoid carbon steel, hardened and tempered at a relatively low temperature, has been found to be slightly lower in an atmosphere of hydrogen or of nitrogen than in air. If the same steel was tempered at a somewhat higher temperature, the rate of wear in hydrogen or nitrogen was relatively enormous as compared with the rate of wear in air. Under these latter conditions, oxide films on the wearing surfaces of the specimens markedly reduced the rate of wear.



—Courtesy Armstrong Bros. Tool Co., Chicago

Clamps for holding work during assembly and fabricating operations are made in several types and a wide variety of sizes. They range in weight from ½ pound to 40 pounds each and are manufactured almost exclusively of steel

LARGE USES OF STEEL IN SMALL WAYS

255th Article ◆ "C" Clamps

A LARGE number of manufacturing and fabricating operations require the use of some form of device to hold or clamp parts together during assembly. One of the commonest types of holders is the "C" clamp, made in various sizes and adapted to many sorts of service. This clamp is made in "C" shape, from which it derives its name, and by means of a screw securely holds together the pieces being worked.

The largest outlet for these clamps is the body building division of the automotive industry, where they are employed extensively in holding component body parts in place while they are being affixed permanently to form the complete unit.

Use Spurred by Welding

In structural steel erection and fabrication, in welding and in various other metalworking processes, clamps find extensive use. The same is true in the woodworking industry. Welding has provided an increasing market for clamps, these devices being used in large numbers to hold in position temporarily the parts to be joined. Steel framework construction by the use of welding requires a large number of "C" clamps. These clamps also may be employed in lifting or moving bulky articles which lack some means for attaching a crane hook, chain or cable.

"C" clamps now are made almost exclusively of steel, and their production accounts for the annual consumption of nearly 500 tons of this metal. Formerly some clamps were made of malleable iron. The clamp proper is forged from carbon steel bars, then is machined and heat treated; alloy steel generally is not used other than for the screw member.

Several types of clamps are available, as indicated in the accompanying illustration. For heavy duty, a thick throat section is provided, such a clamp being shown in the center of the illustration. The screw head of this type is square. Lighter clamps are provided with a wing nut or cross bar for turning the screw and, in addition, have a swivel cap or ball and socket joint on the contact end of the screw to prevent twisting the pieces of an assembly during the clamping operation.

Clamps are available in different dimensions, commoner sizes accommodating pieces from ¾-inch to 18-inches thick, with weights ranging from ½-pound to 40 pounds.

Analyses, Properties, Uses of Stainless Steels Reviewed

Of interest to all buyers and users of stainless and heat-resisting steels is a handsomely prepared 48-page booklet dealing with these materials, just issued by the committee on stainless and heat-resisting steels of five subsidiary companies of the United States Steel Corp.—American Sheet & Tin Plate Co., Carnegie Steel Co. and National Tube Co., Pittsburgh; and the American Steel & Wire Co. and Illinois Steel Co., Chicago.

Compositions, physical properties, resistance to various corrosive agents and recommended procedure for fabricating are given for various grades of stainless steel produced by these companies, including, 18-8 chrome-nickel, 18-8 stabilized (resisting intergranular corrosion), 18-12 chrome-nickel, 17 chromium, 12 chromium, 27 chromium, 25-12 chrome-nickel, and the like.

Typical applications for this series of steel are summarized, and a chart presented giving nominal properties of the materials in tabular form. Interesting adaptations of stainless steels in various fields are shown in 33 illustrations. Copies of the booklet may be obtained by addressing any one of the above companies.

Offers New Stainless-Clad For Paper Mill Service

A new stainless clad steel, developed to meet the unusually severe requirements of a corrosion-resisting material in the pulp and paper industry, is announced by the Ingersoll Steel & Disc Co., division of the Borg-Warner Corp., Chicago. This new steel, known as Ingoclad 23-11, is two ply, having a 20 per cent stainless layer of 23 per cent chromium, 11 per cent nickel steel bonded to mild carbon steel. It is produced under the Ingersoll patented process.

It is claimed that new clad material will resist corrosion encountered in both sulphite and sulphate applications to better advantage than the regular 18-8 series of alloys and at a price which is materially less than that of comparable stainless steels. It is available in sheet or plate form in all commercial sizes.

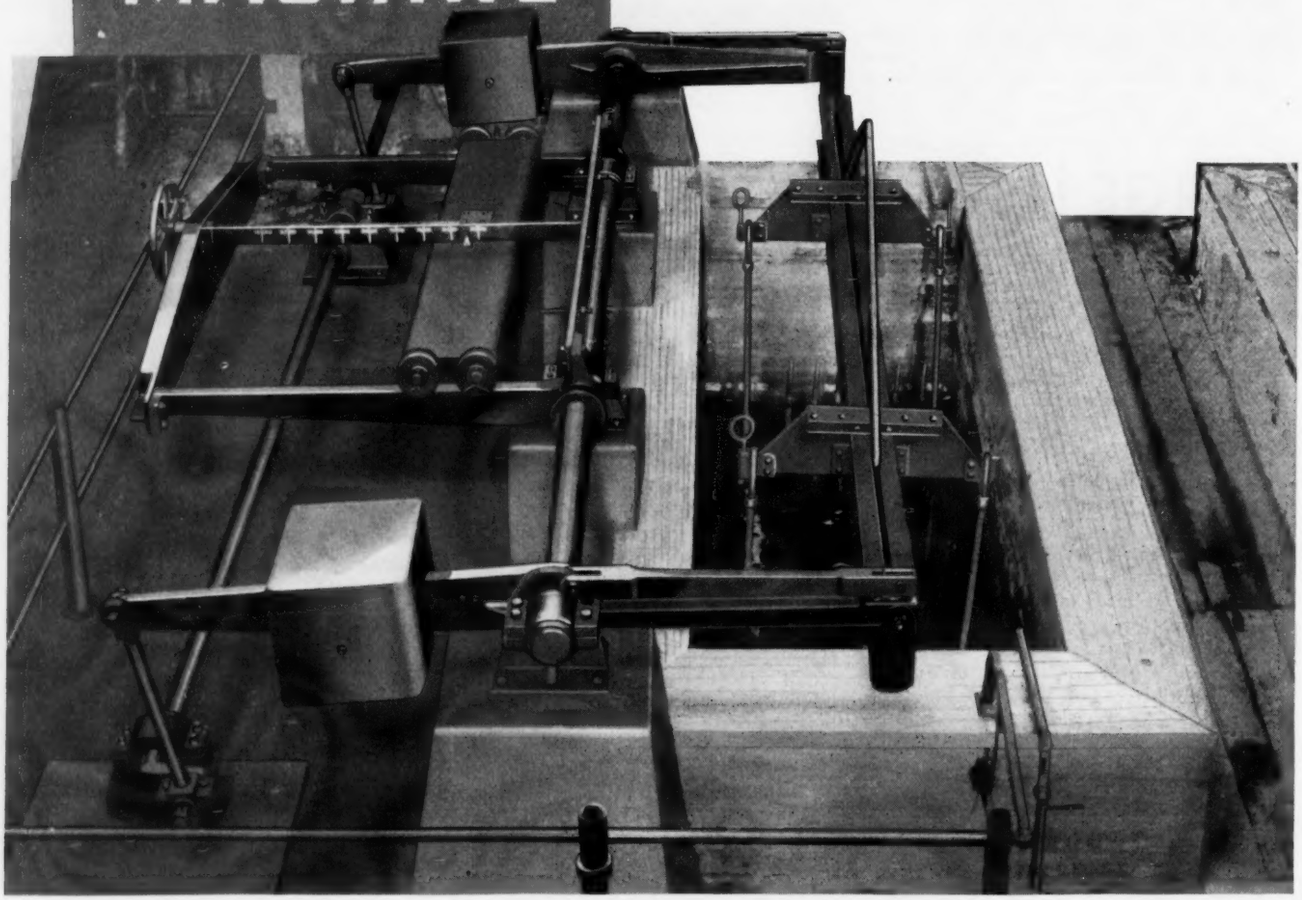
Arrange Foundry Practice Meeting in Birmingham

A foundry practice meeting will be held in Birmingham, Ala., Feb. 19-20 by the Birmingham section of the American Society of Mechanical Engineers with the American Foundrymen's association co-operating. Headquarters will be at the Tutwiler hotel.

The program will include plant visitations, a technical session and a dinner. Papers to be presented are "Dust Abatement in the Foundry with Special Reference to Certain Engineering Aspects," by E. O. Jones, National Founders' association, Chicago, and "Developments in Castings' Applications Through Use of Alloys," by E. K. Smith, Electro Metallurgical Co., Chicago.

HAINES PICKLING MACHINE

FOR SHEET AND TIN PLATE MILLS



LOW FIRST COST . . . LOW COST OF OPERATION . . . LOW UPKEEP COST . . . EASY TO OPERATE . . . EXTREMELY SIMPLE . . . LOADS AND UNLOADS SHEETS VERY RAPIDLY

THE "HAINES" PICKLING MACHINE is very simple in design, and requires only a very small motor for operation because it is designed with a counter-balancing device. This special device provides for setting the balance of any load in a moment's time. All parts rest on the floor level.

Either wood or concrete tanks can be used with the "Haines" Pickling Machine. It can be furnished in either single or double units and is built to handle all types of sheets and also bars of any length for cold rolling or cold drawing The extremely simple construction of this machine insures a low cost of installation, operation and maintenance.

LEWIS

LEWIS FOUNDRY & MACHINE CO.

P.O. BOX 1591 PITTSBURGH, PA.

PROGRESS IN STEELMAKING

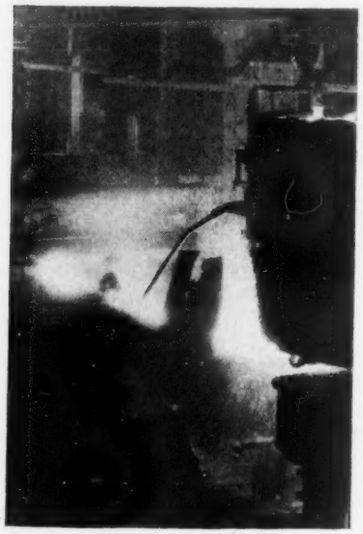
GAS, fired through tubes of heat-resisting metal, is a feature of a newly designed furnace similar to the bell-type electric furnace, for box annealing steel. The tubes serve practically the same purpose as the resistors but may be used for forced cooling should conditions demand.

♦ ♦ ♦

Features of a newly designed squaring shear for sheets and black plate include an independent chuck for carrying the lower knife, thus permitting permanent location of the bed and facilitating adjustment of the knife alignment. The crosshead carrying the upper shear blade is counterbalanced with air cylinders which operate with practically no air loss inasmuch as the down stroke forces the air to return to the line. The holddowns are self adjusting for different thicknesses of material, building up pressure as the thickness of material increases.

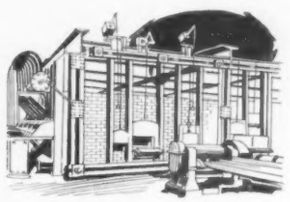
♦ ♦ ♦

Placing guards around coke jacks or salamanders employed around iron and steel plants for protecting water lines and ore in stockhouse bins from freezing has proved satisfactory at many plants. Some employ latticed fencing made of skelp; others use merchant angles or pipe welded to brackets in such a way that the guard extends out about 18 inches from the coke jack.



♦ ♦ ♦

Protecting the surface of bright finished wire is accomplished by a producer by dipping the bundles before shipment in a diluted solution of a by-product of the wool scouring industry known as De-Gras. The coating if objectionable can be removed with kerosene.



Observing flame conditions in boilers and billet, slab, skelp and other type of industrial heating furnaces is facilitated by a newly developed port. A glass window for eye protection and a divided cover, which closes automatically when the handle is released, are two features of the new port.

♦ ♦ ♦

Considerable research has resulted in the development of a treatment for wood screws which greatly improves their driving properties. The treatment, obtained by a chemical process, can be applied to any screw or metal product. Tests disclose that in cases where untreated screws cannot be driven or only with considerable difficulty, the treated screws are driven with comparative ease. Careful tests show that to drive a treated screw by a portable electric screw driver requires only about one-third the power necessary for a plain wood screw of equal size under identical conditions. The need for resorting to soaping, waxing, greasing or otherwise lubricating screws before driving thus is made unnecessary.

♦ ♦ ♦

Improper lubrication of sheet mill drives frequently results in power losses ranging from 20 to 30 per cent.

♦ ♦ ♦

Electric process ingots weighing about 67 tons each and virtually free from nonmetallic inclusions now are poured at the steelworks of Thos. Firth & John Brown, Sheffield, England, as a result of the recent installation of what is said to be the largest high-frequently electric furnace in Europe.

♦ ♦ ♦

Removing scale from sheet bars is accomplished at a plant in England by the combination of water sprays, scrapers and wire brushes. A pair of heated sheet or tin bars is placed on a receiving table below the surface of which a conveyor chain operates continuously. A lug on this chain moves the lower bar of the pair into the machine while the top bar is held stationary by an adjustable arm. The bar in transit through the machine passes beneath a water spray which breaks down the scale. The piece then passes under a scraper and a cylindrical wire brush which remove the scale. As the piece progresses it encounters a hook located in the path of travel and is turned over. The piece continuing on its way passes beneath the secondary scraper and wire brush. The second sheet bar is treated in the same manner. Sheet and tin bars subjected to this treatment afford the production of clean sheets and black plate.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Annealing Furnace—Pittsburgh Lectromelt Furnace Corp., P. O. box 1125, Pittsburgh, recently brought out a new unit to meet the increasing need for suitable equipment for bright annealing both ferrous and nonferrous products as well as for other processes demanding controlled heat treating. It is built in two types, circular and rectangular. Hoods are readily removable and portable, as are the bases upon which the charge is stacked. Egress of furnace atmosphere and ingress of air are prevented in the unit by means of a double seal arrangement. One of the most important features is the patented diffusing device for controlling the furnace atmosphere.

♦ ♦ ♦

Air Filter—Coppus Engineering Corp., Worcester, Mass., recently introduced an automatic, self-cleaning air filter that employs a special wool felt for the filter curtain arranged in the shape of an endless belt running in zig-zag fashion over rolls. Bottom rolls are connected by chains and sprockets to a small geared electric motor which is started either by a time clock at predetermined intervals or with the aid of a sensitive pressure gage whenever a maximum air resistance is reached. The filter curtain moves slowly over the rolls and passes over a special suction nozzle connected to a vacuum cleaner.

♦ ♦ ♦

Boring, Milling, Drilling Unit—Morton Mfg. Co., Muskegon Heights, Mich., recently developed a universal tool which combines the features of horizontal boring, drilling, milling, vertical milling, right-angle boring, shaping, planning and slotting. It has a 48-inch cutting stroke and a bed 14 feet long, providing 9 feet of horizontal feed and 48 inches of vertical feed on the column. This machine has an improved feed change gear box with a range of 30 feed changes for boring and milling.

♦ ♦ ♦

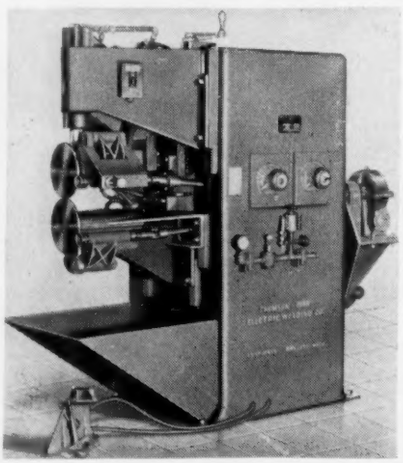
Crankpin Grinder—Norton Co., Worcester, Mass., recently introduced a crankpin grinder designated D-85. The unit has a swing of 17 inches and can be supplied in two lengths, namely 28 to 40, and 40 to 52 inches. The machine is the double-head type with the left head fixed longitudinally with a lateral adjustment, and the right head fixed laterally with a longitudinal adjustment. Wheel head traverse and feed, table travel and opening of work holder clamps are operated hydraulically. In addition to levers controlling power movements of table and wheel head, handwheels are provided to jog the table for splitting the spark, and feeding the wheel during grinding.

♦ ♦ ♦

Flow Meters—Republic Flow Meters Co., Chicago, recently announced a complete revamping of design of its flow meters. The new design is built around the cartridge sealed element which consists of the actuating unit built to fit into a metal cartridge to form a compact, sturdy element ready for mounting on the instrument panel. There are three types of reading instruments, the indicator, the recorder and the integrator, each with its actuating mechanism mounted in a separate cartridge sealed element which is interchangeable and may be removed easily from the back of the panel.

♦ ♦ ♦

Seam Welder — Thomson-Gibb Electric Welding Co., 162 Pleasant street, Lynn, Mass., has designed a seam welder for mass production of straight or circular seam welds of ferrous metals, corrosion resistant steels and, with slight modifications, nonferrous metals. The 1000 series unit handles objects of 10½-inch diameter and 12 inches in length to 40-inch diameter and 45 inches in length at welding speeds varying



from 2 to 15 feet per minute. Welding pressures employed range from 650 to 1400 pounds. An efficient cooling system is another feature of the new design, shown herewith.

♦ ♦ ♦

Industrial Roller Bearings—Fafnir Bearing Co., New Britain, Conn., recently introduced roller bearings for industrial application. The bearing consists of the conventional inner and outer rings and roller cage assembly. Additional capacity is gained by increasing the roll length and by using two rows of rollers where necessary. An added feature is the use of two-part rolls which prevent skewing. The entire assembly is made with a fixed radial clearance to allow for the expansion that takes place when the inner ring is shrunk to the shaft.

♦ ♦ ♦

Excess Temperature Cut-Out—Hevi-Duty Electric Co., Milwaukee, is marketing a temperature protection unit for all types of heating equipment. The excess temperature cut-out, as it is known, may be set to cut-out a few degrees above the normal operating temperature of the heating equipment. Where no automatic control equipment is employed, the cut-out, in addition to its normal function, can be connected to flash a light or sound an alarm, or both, when excess temperature is reached.

♦ ♦ ♦

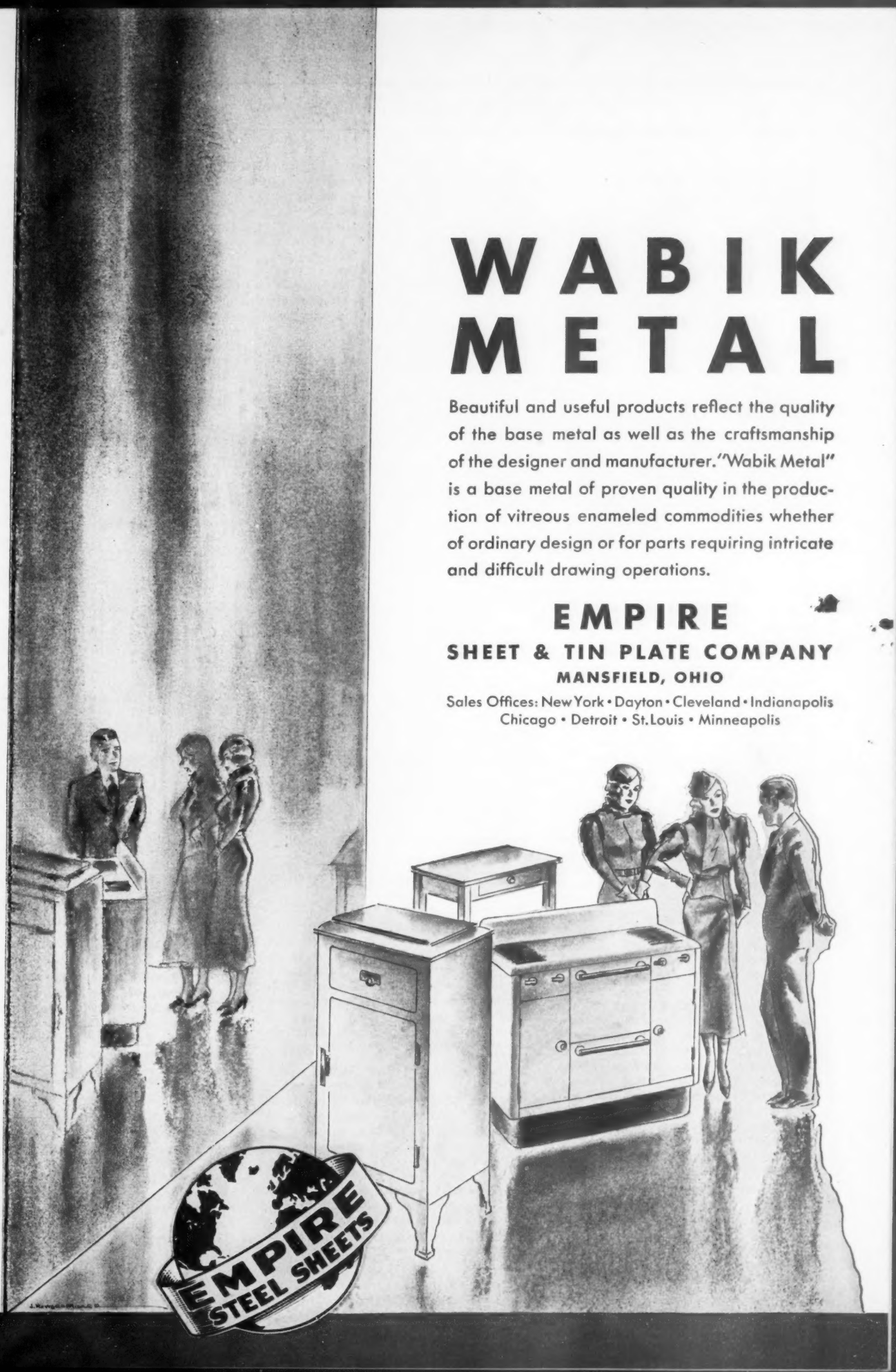
Arc Arrester—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., recently announced that it now is possible to speed alternating-current arc extinctions with a simple single-break type of contactor by inclusion of an arc arrester. This recent development for mounting on the base of a contactor or linestarter involves a small unit consisting of a small capacitor and resistor connected across the poles on the load side of the contacting device.

♦ ♦ ♦

Tape-Rule—Lufkin Rule Co., Saginaw, Mich., is marketing a new 6-foot tape-rule which has a steel blade ½ inch wide that can be projected like a rule yet also will flex and accurately measure circles, etc. A sturdy nickel plated case fully encloses the blade and is pocket size, being 1⅞ inches in diameter.

♦ ♦ ♦

Automatic Lathe—Jones & Lamson Machine Co., Springfield, Vt., has announced a new 8-inch lathe which is a universal machine completely automatic in its cycle. It may be employed for machining washing machine and refrigerator parts valves, valve stems and bushings, small shafts similar to those used in auto starters and generators, small pistons and similar parts. The unit also is adapted for light finishing operations on larger work such as automobile transmission shafts and parts. Multiple tooling can be ar-



WABIK METAL

Beautiful and useful products reflect the quality of the base metal as well as the craftsmanship of the designer and manufacturer. "Wabik Metal" is a base metal of proven quality in the production of vitreous enameled commodities whether of ordinary design or for parts requiring intricate and difficult drawing operations.

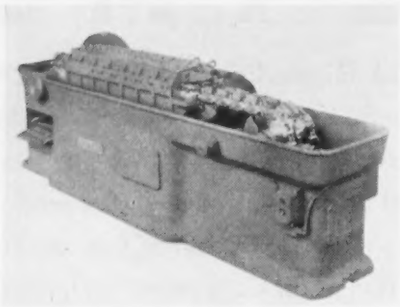
EMPIRE
SHEET & TIN PLATE COMPANY
MANSFIELD, OHIO

Sales Offices: New York • Dayton • Cleveland • Indianapolis
Chicago • Detroit • St. Louis • Minneapolis

ranged on the carriage to turn various diameters straight or taper. The back arm is designed to face and form any number of shoulder lengths or diameters.

♦ ♦ ♦

Surface Broaching Machine—Foote-Burt Co., 13000 St. Clair avenue, Cleveland, recently placed on the market a new type of surface broaching machine. Work holding



fixtures are assembled directly to a chain employed to pull them through the fixture tunnel mounted on top of the bed. The broach holder is made with adjustable wedges to provide an easy method of setting the broaches to the cut and to compensate for metal removed when the broaches are reground. After fixtures pass through the broach cut, they automatically are released by a cam and the work fall out into a discharge chute. The illustration herewith shows the type of fixture used for holding a connecting rod cap.

♦ ♦ ♦

Steel Binding—Stanley Works, New Britain, Conn., recently placed on the market a new type of steel binding to be used particularly for products subjected to pilferage during transit. The binding can be used only once; it can not be cut off the case and re-applied because when cut it automatically becomes too short.

♦ ♦ ♦

Panelettes—Square D Co., Switch & Panel division, Detroit, has introduced a new line of panelettes to accommodate Despard apparatus. The units provide for single-pole, two-pole three-way and four-way switches, convenience outlets, pilot lamps and lock switches. Knockouts for the fittings are arranged in gangs of three but may be used for one or two devices if desired.

♦ ♦ ♦

Welding Glass Tester—Pyrometer Instrument Co., 103 Lafayette street, New York, recently announced equipment for testing welding or absorption glass. A pyro supersensitive radiation tube used in connection with a rapid recorder or an indicator will clearly record on a chart or indicate the percentage of transmission or quantity of infra-red rays in glass compared to the total energy of heat rays transmitted. The announcement bring out that the factor of injurious ultra-violet and infra-red rays from the standpoint of eyesight, are the most disturbing elements encountered in the use of welding glass.

♦ ♦ ♦

Tumbling Barrel—N. Ransohoff Inc., Cincinnati, recently developed a welded steel tumbling barrel. The unit introduces a new method of tumbling castings and forgings that eliminates all manual handling of stars and other tumbling material. It is a side-loading barrel with a central tumbling section and two end sections for receiving the separated stars. Passages of patented design transfer the stars automatically to the central section when the drum is rotated in the tumbling direction and return them to the end sections when operation is reversed.

♦ ♦ ♦

Oil Engine—Northwest Engineering Co., 28 East Jackson boulevard, Chicago, recently placed on the market an oil engine for shovel and dragline service. The company claims that the unit is as simple as a gasoline engine. It burns the lighter distillates. Due to special combustion chamber design and correct manifolding, the heavy oil reaches the cylinder in practically the same condition as does gasoline. The fuel conversion system meters the fuel accurately to the engine and atomizes it finely into the air stream.

♦ ♦ ♦

Gear Pump, Fluid Motor—Vickers Inc., Detroit, recently brought out a balanced gear pump and fluid motor. Of particular importance, according to the manufacturer, is the fact that this unit when used either as pump or motor, cannot bind or lock. As a motor it can be started under full pressure and has full torque when stalled. Any unit may be used as pump or motor, rotation being reversible without internal change.

♦ ♦ ♦

Magnetic Clutch-Coupling—Dings Magnetic Separator Co., Milwaukee, recently developed a new magnetic clutch-coupling. Contact surfaces are serrated to provide positive engagement when the magnet coil is energized. In connection with mill screwdowns, this unit proves particularly valuable, it is claimed. Where separate motors are employed on the screwdowns the worm shafts can be "tied together" after individual screw adjustment and this adjustment maintained in later screw movement.

♦ ♦ ♦

Ratio Valve—Maxon Premix Burner Co., Muncie, Ind., has developed a ratio valve to meet the demand for a unit that will assure correct proportions of gas and air. It is designed especially for use with the company's mechanical mixing type gas burners, providing a means for controlling the respective volumes of gas and air entering the mixing chamber of the burner. Movement of a single operating arm varies the burner rate to meet the requirements of the operation.

♦ ♦ ♦

Lapping Machine — Porter-Cable Machine Co., Syracuse, N. Y., announces a tungsten-carbide tool lapping machine. In addition to tools, other parts may be lapped on the machine. When used with an abrasive disk cemented to a cast iron disk it can be employed for removing burrs and for other types of free-hand grinding after milling, pressing, and screw machine operations.

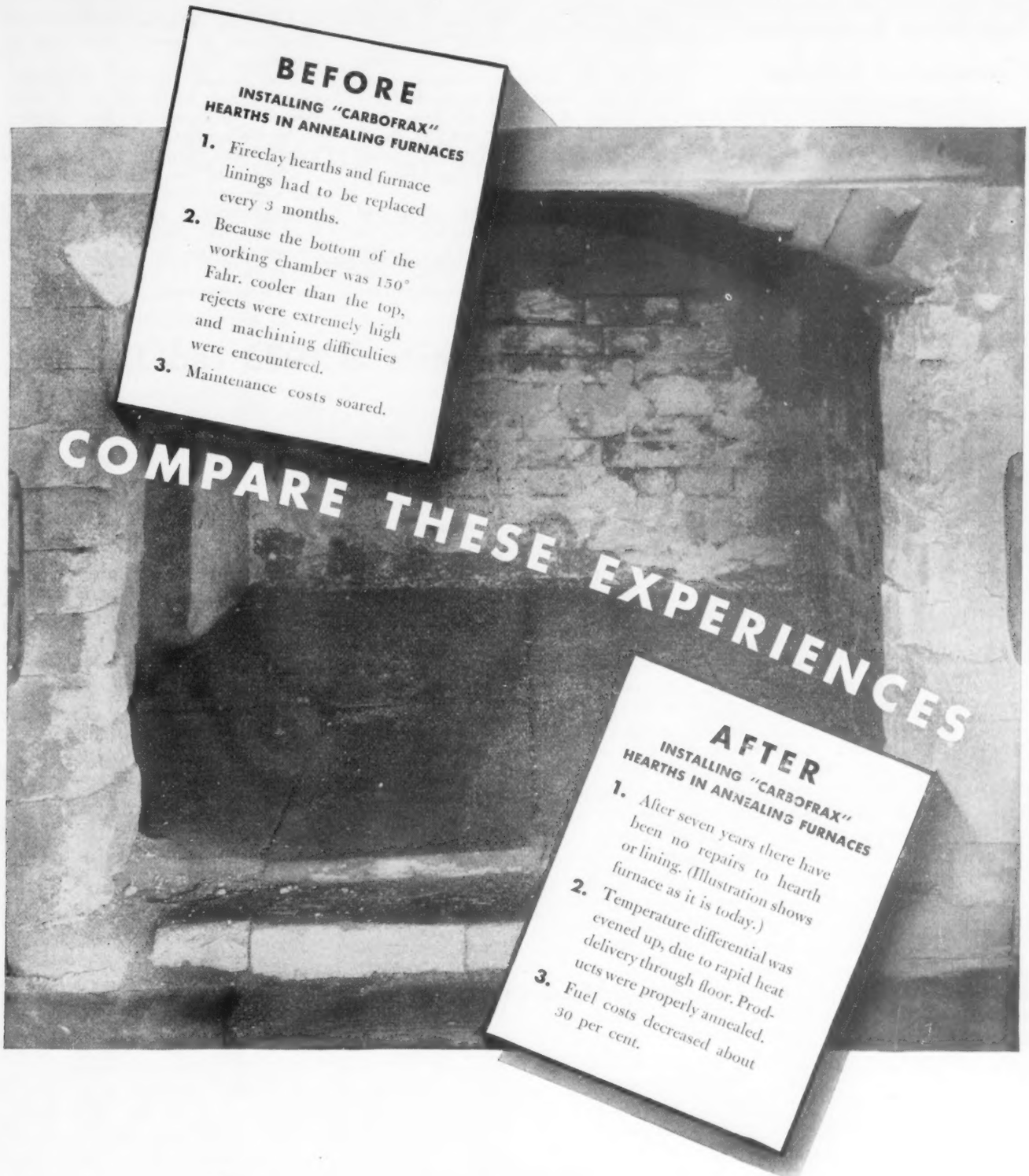
♦ ♦ ♦

Valve—Rigby Mfg. Co. Inc., 716 High street, Sharon, Pa., is marketing a precision valve for oil or natural gas service in plants. An outstanding feature is the replaceable seat which can be quickly applied when abrasion or corrosion necessitate it. Neither the orifice in the head nor in the replaceable seat need be altered to vary the flow which is accomplished by substitution of rotors that are quickly interchangeable.

♦ ♦ ♦

Combustion Test Set—Hays Corp., P. O. box 299, Michigan City, Ind., is marketing a combustion test set for service engineers, heating engineers, installers of oil and gas burners, stokers, etc. This set combines the Hays CO_2 analyzer and the dry type pointer gage, housed in steel case, providing a light weight portable unit. A small fountain pen type flue gas thermometer also can be supplied. Convenient reels and clamps for rubber tubing and accessories are furnished. A test can be started as soon as the case is opened.

CONFORMING to its established policy of conciseness, STEEL now presents announcements and descriptions of new equipment in brief but comprehensive form. Full particulars concerning any item on this page may be obtained direct from the manufacturer.


BEFORE
INSTALLING "CARBOFRAX" HEARTHS IN ANNEALING FURNACES
1. Fireclay hearths and furnace linings had to be replaced every 3 months.
2. Because the bottom of the working chamber was 150° Fahr. cooler than the top, rejects were extremely high and machining difficulties were encountered.
3. Maintenance costs soared.
COMPARE THESE EXPERIENCES
AFTER
INSTALLING "CARBOFRAX" HEARTHS IN ANNEALING FURNACES
1. After seven years there have been no repairs to hearth or lining. (Illustration shows furnace as it is today.)
2. Temperature differential was evened up, due to rapid heat delivery through floor. Products were properly annealed.
3. Fuel costs decreased about 30 per cent.

THIS is the experience of a famous New England tool manufacturing plant. Other users report similar advantageous results. Perhaps our engineers can be useful to you.

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The Carborundum Brand Silicon Carbide Refractory

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THE CARBORUNDUM COMPANY (Refractory Division) Perth Amboy, N. J. District Sales Branches: Chicago, Cleveland, Detroit, Philadelphia, Pittsburgh. Agents: L. F. McConnell, Birmingham, Ala.; Christy Firebrick Company, St. Louis; Harrison & Company, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Taxas; Williams and Wilson, Ltd., Montreal-Toronto, Canada. (Carborundum and Carbofrax are registered trade marks of The Carborundum Company).

Iron Mines Reopened as Consumption Increases

(*Concluded from Page* 19)

magnetic iron ore sintering plants on the Mesabi range remained idle for the ninth consecutive season. The Ford Motor Co. increased its shipment from its Imperial mine on the Marquette range from 14,574 tons in 1932 to 54,041 tons in 1933, while the tonnage from its Blueberry mine, which it transferred late last year to other hands, dropped from 55,152 to 46,333.

The slump in 1932 was accompanied by shifting operations in which the demand for work was more important than need for ore. The 1931 shipments, 23,496,228 tons, were nearer the 1933 level. Therefore, range figures for 1933 are compared with 1931:

The Marquette range accounted for 12.95 per cent of all the ore in 1933, as against only 7.7 per cent in 1931. This was due to the liquidation of stocks and large shipments to a leading independent steelworks which now is heavily interested in properties there.

The Mesabi range's proportion dropped from 65 to 62, due in some measure to excessive taxes tending to bridle operations. Other ranges showed little variation.

Figures in the accompanying table were compiled by the Lake Superior Iron Ore association, Cleveland, carrying forward compilations beginning with the opening of the mines initiated by *Iron Trade Review*, STEEL's predecessor.

Lake Superior Iron Ore Shipments in 1933 and 1932

Mesabi Range

	1933	1932		1933	1932		1933	1932		1933	1932
Adams-Spruce Group	987,610	109,837	Harrison	151,460	.....	Mesabi Chief	477,845	221,742	South Uno (N. P.)	28,036	.....
Agnew	42,293	18,437	Harrison Annex	.....	1,457	Minnewas	505,581	.....	Susquehanna	225,182	.....
Alexandria	221,187	.....	Hartley-Burt-Palmer	2,175,464	345,676	Missabe Mt.	549,306	5,019	Union	128,971	.....
Bennett	44,592	.....	Hawkins	118,573	51,568	Mississippi	33,006	.....	Utica Extension	67,750	38
Biwabic	34	.....	Hill Annex	564,398	.....	Morris	228,282	37,200	Wacootah	221,388	29,343
Bruce	118,037	19,393	Hoadley (Crosby)	143,948	.....	Morrison	588,319	.....	Wade	.....	124,244
Burt-Pool-Day	333,043	5,053	Hull-Rust	257,648	144,028	No. Harrison	125,048	.....	Webb	167,738	.....
Canisteo	302,326	.....	Kevin	23,816	.....	No. Harrison Annex	.....	6,624	Wheeling	154,089	28,458
Commodore	53,248	.....	Kinney	168,568	.....	North Uno (N. P.)	13,013	.....	York	65,802	.....
Dale	17,999	.....	La Rue	87,736	8,845	Patrick-Ann.	123,666	13,337			
Drew	52,047	.....	Leonidas	532,387	10,406	St. Paul	339,549	.....	Total	13,471,625	1,934,719
Dunwoody	319,243	.....	Lincoln	109,270	.....	Sargent	60,374	74,090			
Fayal	212,881	73,730	Mace No. 2	100,515	.....	Scranton	.....	10			
Genoa-Sparta	65,741	.....	Mahoning	.....	1	Sellers	1,082,435	263,431			
Godfrey	204,146	237,243	Malta	21,638	.....	Shenango	463,438	10,346			
Halobe	111,205	.....	Margaret	176,452	12,781	South Uno (G. N.)	14,609	.....			
Harold	90,693	82,382									

Menominee Range

	1933	1932		1933	1932		1933	1932		1933	1932
Balkan-Judson	52,682	.....	Davidson Group	139,084	.....	Loretto	15,644	15,640	Virgil	48,889	4,551
Baltic	1,827	.....	Fogarty	25,464	7,538	Monongahela	63,289	.....	Warner	97,430	.....
Bates	58,473	90,755	Genesee	99,197	85,814	Odgers	531	1,607	Zimmerman	.....	7,582
Bengal	22,647	.....	Hiawatha	143,542	41,446	Penn Mines	385,211	.....			
Bristol	50,531	2,537	Homer	84,776	.....	Rogers	27,476	40,449	Total	1,510,985	307,721
Buck	53,948	.....	James	30,457	.....	Sherwood	398	.....			
Caspian	71,231	.....				Tobin	38,258	9,802			

Marquette Range

	1933	1932		1933	1932		1933	1932		1933	1932
Archibald	2,264	572	Francis	11,262	.....	Lake Superior Holmes	51,953	.....	Richmond	35,408	64,019
Athens	237,283	6,055	Gardiner-Mackinaw	147,146	.....	Lloyd	171,917	5,926	Stephenson	15,900	.....
Blueberry	55,152	46,333	Greenwood	22,096	5,054	Maas	465,893	79,090	Tilden	94,104	19,957
Cambria	303,739	55,757	Imperial	54,041	14,574	Morris	311,468	20,095	Volunteer	39,888	.....
Cleveland-Cliffs Group	190,570	29,806	Isabella	121,127	.....	Negaunee	476,114	10,024	Total	2,807,325	357,262

Gogebic Range

	1933	1932		1933	1932		1933	1932		1933	1932
Anvil	23,085	.....	Ironton	326,219	226,561	Norrie Group	207,347	.....	Townsite	117,330	36,407
Cary	171,956	.....	Keweenaw	82,126	.....	Palms	26,621	.....	Wakefield	90,598	.....
Eureka-Asteroid	189,413	50,420	Montreal	471,389	320,235	Plumer	.....	39,802			
			Newport	284,195	.....	Sunday Lake	410,653	.....	Total	2,400,932	673,425

Cuyuna Range

	1933	1932		1933	1932
Armour No. 1	119,443	16,146	Mahnomen-Hopkins	5,455	.....
Armour No. 2	48,325	52,518	Martin	18,334	.....
Croft	184,580	.....	Merritt	.....	270
Evergreen	55,627	10,499	Milford	50,005	.....
Hillcrest	307	.....	Portsmouth	86,862	4,510
Ironton	12,808	.....	Sagamore	115,955	25
Louise	.....	1,129			

Vermillion Range

	1933	1932		1933	1932
Wearne	43,438	.....	Pioneer	370,030	172,980
			Sibley	153,638	24,903
Total	741,139	98,737	Soudan	61,434	18,861
			Zenith	155,302	.....
			Total	740,404	216,744

GRAND TOTAL 21,672,410 3,588,608

Strong Demand Lifting Rate Over 40% Mark

Automotive Industry Getting Into Stride, Filling Up Sheet and Strip Mills—Heavy Railroad Releases Coming—Raw Materials Steadily on Upgrade

RAPIDLY mounting demand from the automobile industry and broadening in general manufacturing requirements were chiefly responsible last week for a gain of 3 points to 39 per cent in the steelworks operating rate—highest since the second week in October—and insure the rate will pass 40 per cent this week.

That this has been accomplished in advance of heavy releases by railroad carbuilders on orders recently placed, and rail tonnages, leads steelmakers to anticipate a continuing upward trend the remainder of February, when an inflow of seasonal construction work is expected to provide further momentum.

Unfilled orders for automobiles, estimated to exceed all that makers can produce in the first half of the year, apprehension over a shortage in material, and possibility of labor difficulties have resulted in a wave of buying. Leading sheet and strip mills are booked up through March; output in important districts has been lifted to capacity, and some eastern interests are contemplating adding to their facilities for wide automotive sheets.

At Pittsburgh tin plate mill operations have risen 25 points to 60 per cent, on an influx of orders from canmakers, a month and a half before the usual period for buying.

Railroad Equipment Program Calls for 30,000 Cars; Builders Preparing Specifications

First specifications on 170,000 tons of rolled steel and approximately 110,000 tons of other iron and steel products, for the 12,725 freight cars and 159 coaches awarded 12 builders by the Van Sweringen lines, are expected this week. This is the beginning of a general car building program which shortly will total 30,000, the Atlantic Coast Line, Illinois Central, Chicago, Milwaukee, St. Paul & Pacific and other roads preparing to enter the market. Lehigh & New England has awarded 500 freight cars.

The Southern Pacific has divided 40,000 tons of rails among three producers. The Chicago & North Western has completed final details on a loan to purchase 26,512 tons of rails and 6370 tons of fastenings; and the Chicago & Eastern Illinois, for 4000 tons of rails and 1000 tons of tie plates. Detroit Street Railways are in the market for 1500 tons of steel ties.

Distribution is expected momentarily on 23,000 tons of plates, shapes and bars, 18,000 wheels and 3000 axles, one-third estimated requirements for the Pennsylvania's carbuilding program. A Pittsburgh manufacturer has booked 7000 air brakes for this line.

Building construction has not yet contributed its quota to the upswing in steel demand, though structural shape awards for the week—15,549 tons—hold fairly close to the recent average.

Prices for second quarter are being examined critically, with sheetmakers apparently decided on an advance. A reduction of $1 a ton in hot strip at Chicago, effective Feb. 15, is considered merely as an adjustment of the differential over the Pittsburgh base, in line with other finished products, strip being scheduled for an increase.

Foundry Coke and Pig Iron Shipments Heavier; Steel Corporation Purchases More Schrap

Raw materials are more active, foundry coke shipments 45 per cent higher than the January rate, and the pig iron movement up 25 per cent. Further strength has been imparted to scrap by the Steel corporation's purchase of 20,000 tons for its National Tube subsidiary at Lorain, O., following its recent order for 17,000 tons for the Carnegie Steel mills at Pittsburgh.

STEEL'S London cablegram states Japan is placing contracts for sheets in Europe. Recent British importations of Canadian billets have disturbed Continental makers. In Canada Dominion Steel & Coal Corp. is reported to have booked 6000 tons of rods for its Sydney, N. S.

Steelworks operations last week rose 6 points to 37 per cent at Chicago; 5 to 74 at Cleveland; 5 to 69, Wheeling; 3 to 21, Pittsburgh; 3 to 37, Buffalo; 3 to 41, Youngstown. They remained 82 per cent in New England; 79, Detroit; and 52, Birmingham; and were reduced 1 point to 24½ per cent in eastern Pennsylvania.

The more rapid expansion in steelworks operations emphasizes the favorable beginning the industry has made this year. Daily average steel ingot output in January—73,959 gross tons—was only 1.6 per cent over December, but 86 per cent higher than in January 1933, and 31 per cent above the month in 1932. Total production last month was 1,996,897 tons.

STEEL'S iron and steel price composite is unchanged at $32.42; finished steel remains $51.10, while the scrap figure is up 4 cents to $11.58.

COMPOSITE MARKET AVERAGES

	Feb. 10	Feb. 3	One Month Ago Jan., 1934	Three Months Ago Nov., 1933	One Year Ago Feb., 1933	Ten Years Ago Feb., 1924
Iron and Steel Composite	$32.42	$32.42	$32.42	$31.59	$28.31	$43.49
Finished Steel Composite	51.10	51.10	51.10	49.20	45.35	67.48
Steelworks Scrap Composite	11.58	11.54	11.24	9.64	6.33	18.67

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Feb. 10, 1934	Jan. 1934	Nov. 1933	Feb. 1933
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.75	1.60
Steel bars, Chicago	1.80	1.80	1.80	1.70
Steel bars, Philadelphia	2.04	2.04	2.04	1.91
Iron bars, Terre Haute, Ind.	1.60	1.60	1.60	1.65
Shapes, Pittsburgh	1.70	1.70	1.70	1.60
Shapes, Philadelphia	1.90	1.90½	1.90½	1.65
Shapes, Chicago	1.75	1.75	1.75	1.70
Tank plates, Pittsburgh	1.70	1.70	1.70	1.60
Tank plates, Philadelphia	1.88	1.88½	1.88½	1.59½
Tank plates, Chicago	1.75	1.75	1.75	1.70
Sheets, No. 10, hot rolled, Pitts.	1.75	1.75	1.75	1.60
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.00
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.50
Sheets, No. 10, hot rolled, Gary	1.85	1.85	1.85	1.60
Sheets, No. 24, hot anneal., Gary	2.35	2.35	2.35	2.10
Sheets, No. 24, galvan., Gary	2.95	2.95	2.95	2.70
Plain wire, Pittsburgh	2.20	2.20	2.10	2.10
Tin plate, per base box, Pitts.	5.25	5.25	4.65	4.25
Wire nails Pittsburgh	2.35	2.35	2.10	1.85
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	36.00	36.00	35.00	35.00

	Feb. 10, 1934	Jan. 1934	Nov. 1933	Feb. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	19.26	15.76
Basic, valley	17.00	17.00	17.00	14.00
Basic, eastern, del. eastern Pa.	18.76	18.76	17.76	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	18.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.50	15.50
Southern No. 2, Birmingham	13.50	13.50	13.50	11.00
No. 2X, Eastern, del. Phila.	19.63	19.63	18.63	13.76
Malleable, valley	17.50	17.50	17.50	14.50
Malleable, Chicago	17.50	17.50	17.50	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.38	18.38	18.38	15.63
Ferromanganese, del. Pittsburgh	90.24	90.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$13.50	13.05	11.65	8.35
Heavy melting steel, eastern Pa.	11.75	11.62½	9.55	6.50
Heavy melting steel, Chicago	10.75	10.45	8.35	5.25
No. 1 wrought, eastern Pa.	12.75	12.65	10.15	6.50
No. 1 wrought, Chicago	10.35	9.45	8.10	5.00
Rails for rolling, Chicago	11.75	11.25	10.25	7.75
Coke				
Connellsville, furnace, ovens	3.50	3.60	3.75	1.75
Connellsville, foundry, ovens	4.25	4.25	4.25	2.50

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88c
New York, del.	2.08c
Philadelphia, del.	2.04c
Birmingham, base	1.90c
St. Louis, del.	2.07c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38c
Detroit, del.	2.45c
New York, del.	2.58c
Philadelphia, del.	2.54c
Birmingham, base	2.49c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98c
Philadelphia, del.	3.14c
New York, del.	3.18c
Birmingham, base	3.00c
St. Louis, del.	3.17c
San Francisco, f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.65c
Gary, base	2.75c
St. Louis, del.	2.97c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Detroit, delivered	2.50c
Gary, base	2.40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Detroit, delivered	2.95c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.55
Long ternes, No. 24 unassorted	3.25c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del	1.98c
Philadelphia, del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birmingham, base	1.85c
Coatesville, base	1.80c
Sparrow's Pt., base	1.80c
Pacific Coast, f.o.b. cars, dock	2.25c
St. Louis, del.	1.97c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birmingham, base	1.85c
Pacific Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birmingham, base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, del.	1.90c
Pacific Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.90c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Terre Haute, Ind. base	1.60c
Philadelphia, base..	1.74c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING
New billet, cut lengths, carlots

Pittsburgh	1.90c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c
Philadelphia, del.	2.19c

Rail Steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young.	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.35
Cement coated nails	2.35
Galvanized nails, 15 gage and coarser	4.35c
Do., 16 gage and finer..	4.85c

(Per pound)

Polished staples	3.05c
Galvanized fence staples	3.30c
Barbed wire, galv.	2.85c
Annealed fence wire	2.35c
Galvanized fence wire	2.70c
Woven wire fencing (base column, c.l.)	$60.00
Plain wire, 6-9 gage to mfg. trade	2.20c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Chicago, Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Shafting □ □ □

Turned and ground, Pitts. base

1⅛-inch	3.40c
1 7/16 to 1½-inch	2.90c
1 9/16 to 1 7/8-inch	2.75c
1 15/16 to 2 7/8-inch	2.60c
2 15/16 to 7-inch	2.45c

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton	2.45c
Bethlehem	2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 125-1.75 Ni.	1.05
5100 .80-1.10 Cr	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van	1.50
Carbon van.	0.95
9250	carbon base plus extras

Strip and Hoops □

Hot strip to 23⅛-in. Pittsburgh	1.75c
Do., Chicago	1.85c
Do., del. Detroit..	1.95c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Standard rails, mill	$36.37½
Relay rails. Pitts. 20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag Screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts	70 off
Tire bolts	60 off
Stove bolts, 70-25-10 off in pkgs.; 83 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in., smaller	85 off

SQUARE HEAD SET Screws

Upset, 1-in., smaller	75-10 off
Upset, larger than 1-in.	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c.l., Pittsburgh, Cleveland	2.75c
Struc., c.l., Chicago	2.85c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts:; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pittsburgh	2.00c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD
Steel

In.	Blk.	Gal.
⅛ and ¾	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD
Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE
Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½

Iron

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts. under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron; Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	41
2½—2¾	34	4	46
3	38	4½, 5, 6	43

(On 1—1¾-inch sizes mechanical tubing dis. apply.)

Hot Rolled

2—2¼	33	3¼—3½	47
2½—2¾	40	4	49
3	44	4½, 5, 6	42

Quantity discounts: Under 10,000 lbs., 10 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs. to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Net Ton

6-in., & over, Birm.	$36.00-37.00
4-in., Birm.	39.00-40.00
4-in., Chicago	47.00-48.00
6 to 24-in., Chicago	44.00-45.00
6-in., & over, east. fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base | $90.00

Six to 24-inch, fittings base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, 5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forgings, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Young.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Young.	26.00

WIRE RODS

Pitts., Cleveland	36.00
Chicago	37.00

SKELP

All grades, Pitts., and Chicago	1.60c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.50
Connellsville fdry.	4.25
Connel. prem. fdry.	5.00- 5.25
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del	9.25
New England, del.	10.50
St. Louis, del.	9.25
Birmingham, ovens	5.00
Indianapolis, del.	8.75
Ashland, Ky., Connellsville basis	6.00
Portsmouth, ovens, Connellsville basis	6.00
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.205
90 per cent benzol..	$0.205
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)..	0.163c
Do. (100 lb.)	0.178c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$18.50	$19.00	$18.00	$19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	.....	18.00	.....
From Swedeland, Pa., del. to Philadelphia	19.26	19.76	18.76	.....
From Bethlehem, del. to Brooklyn	20.77	21.27	.....	.....
From Bethlehem, del. to Newark, N. J.	19.99	20.39	.....	.....
Basing Point:				
Everett, Mass.	18.50	19.00	18.00	19.50
From Everett, del. to Boston	19.00	19.50	18.50	20.00
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	19.00	19.50	18.50	20.00
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O.	19.26	19.26	18.76	19.76
Basing Point:				
Jackson, O.	19.25	19.25	18.75	.....
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del. to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	18.00	18.50	17.50	.....
Basing Point:				
†Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham, del. to:				
Boston	18.62	.....	18.12	.....
Newark, N. J.	19.58	.....	.....	.....
Brooklyn, N. Y.	20.39	.....	.....	.....
Baltimore	19.02	.....	18.52	.....
Philadelphia	18.88	.....	18.38	.....
Cleveland	17.62	.....	17.50	.....
Cincinnati	18.13	.....	18.01	.....
Chicago	17.72	.....	17.60	.....
St. Louis	17.62	.....	17.50	.....

†Southern delivery only. Prices at northern points are adjusted to quotations on northern iron.

Basing Point:
Provo, Utah 16.50

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.00. Basing point: Johnson City, Tenn.—$23.00 Philadelphia, standard and copper bearing 24.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson county, O., base; 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base; 10%—$27.25; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore □ □

LAKE SUPERIOR ORE
Gross ton, 51½% Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos.	9.50
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%	7.00
Chrome ore 48% gross ton, c.i.f.	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%	24.00
So. Afr., 49-51%	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00
MALLEABLE BUNG BRICK all bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK
Net ton, f.o.b. Baltimore, Plymouth, Meeting, Pa., Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar 85-5 □ □

Washed gravel, duty paid, tide, gross ton	$21.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$14.75-15.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
del. Pittsburgh	90.24
Spiegeleisen, 19-20%, dom., fur., spot†	26.00
Ferrosilicon, 50%, freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 8.25c Conn. copper

Sheets

Yellow brass (high)	13.75
Copper, hot rolled	15.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base	9.00

Tubes and Pipes

High yellow brass	16.25
Seamless copper	16.25

Rods

High yellow brass	12.25
Copper, hot rolled	12.25

Anodes

Copper, untrimmed	12.75

Wire

Yellow brass (high)	14.25

Old Metals □ □

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Chicago	4.37½-4.87½
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	6.12½- 6.25
Chicago, No. 1	5.75- 6.00
Cleveland	5.50- 5.75
St. Louis	5.75- 6.00
Composition Brass Borings	
New York	4.25- 4.50
Light Copper	
New York	5.25- 5.50
Chicago	4.50- 4.75
Cleveland	5.00- 5.25
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.50- 2.75
Cleveland	3.00- 3.25
Lead	
New York	3.00- 3.25
Cleveland	2.75- 3.10
Chicago	2.75- 3.00
St. Louis	3.10- 3.25
Zinc	
New York	2.25- 2.50
Cleveland	2.25
Chicago	2.12½-2.37½
St. Louis	2.50- 2.75
Aluminum	
Clips, soft. Cleve.	13.50-14.00
*Borings, Cleveland	6.00- 7.00
*Mixed, cast Clev.	10.50-10.75
Mixed, cast, St. L.	9.00- 9.50

Secondary Metals □

Brass ingot, 85-5-5-5	8.25
*Remelt Al., No. 12	15.00-15.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	10.00-10.50
Boston, dealers	7.00- 7.25
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	9.50-10.00
Chicago	10.50-11.00
Cleveland, No. 1	10.50-11.00
Cleveland, No. 2	10.00-10.50
Detroit, No. 1	9.50-10.00
Detroit, No. 2	8.50- 9.00
Eastern Pa.	11.50-12.00
Eastern Pa., No. 2	9.50-10.00
Federal, Ill.	8.75- 9.25
Granite City, Ill.	9.00- 9.50
N. Y., deal. R. R.	8.75- 9.00
N. Y., deal. No. 2	7.50
Pittsburgh, No. 1	13.25-13.75
Pitts., No. 1 (R. R.)	13.75-14.25
St. Louis, No. 1 del.	10.50-11.00
Valleys, No. 1	13.00-13.50

COMPRESSED SHEETS

Buffalo, dealers	9.50-10.00
Chicago, factory	9.25- 9.75
Cleveland	9.50-10.00
Detroit	9.50-10.00
E. Pa., new mat.	10.50
Pittsburgh	13.25-13.75
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	6.00- 6.50
Cincinnati, del.	5.75- 6.25
Cleveland	6.75- 7.25
Pittsburgh	12.00-12.50
St. Louis	5.75- 6.25

SHEET CLIPPINGS LOOSE

Chicago	5.50- 6.00
Cincinnati	5.00- 5.50
Detroit	6.50- 7.00
St. Louis	4.50- 5.00

STEEL RAILS, SHORT

Birmingham	11.50-12.50
Boston, dealers	7.00- 7.25
Buffalo	12.50-13.00
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	13.00-13.50
Cincinnati, del.	11.00-11.50
Detroit	10.50-11.00
Pitts., (open-hearth 3 ft. and less	15.50-16.00
St. Louis	12.50-13.00

STOVE PLATE

Birmingham	6.50- 7.50
Boston, dealers	4.75- 5.00
Buffalo	9.00-10.00
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.00- 6.50
Detroit, net	6.00- 7.00
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	5.50- 6.00
St. Louis	6.50- 7.00

COUPLERS, SPRINGS

Buffalo	11.50-12.50
Chicago, springs	12.50-13.00
Eastern Pa.	14.00-15.00
Pittsburgh	15.50-16.00
St. Louis	11.50-12.00

ANGLE BARS—STEEL

Chicago	11.50-12.00
St. Louis	10.00-10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.50
Cleveland, billet, bloom crops	13.50-14.00
Eastern Pa. crops	14.00-14.50
Pittsburgh, billet, bloom crops	16.00-16.50
Pittsburgh, sheet bar crops	16.00-16.50

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis	10.00-10.50

SHOVELING STEEL

Chicago	10.50-11.00
St. Louis	8.25- 8.75

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	5.00- 5.50
Buffalo, No. 1	8.50- 9.00
Buffalo, No. 2	11.00-11.50
Chicago, No. 1, net	9.00- 9.50
Chicago, No. 2	10.50-11.00
Cincinnati, No. 2	8.50- 9.00
Eastern Pa.	12.50-13.00
N. Y., No. 1 deal	8.00- 8.50
St. Louis, No. 1	7.00- 7.50
St. Louis, No. 2	8.75- 9.25

SPECIFICATION PIPE

Boston	4.50- 4.75
Eastern Pa.	10.00
New York, dealers	5.25- 5.50

BUSHELING

Buffalo, No. 1	9.50-10.00
Chicago, No. 1	9.00- 9.50
Cinci., No. 1 deal	6.00- 6.50
Cincinnati, No. 2	2.50- 3.00
Cleveland, No. 2	8.25- 8.75
Detroit, No. 1 new	8.25- 8.75
St. Louis, No. 1	6.50- 7.00
Valleys, new No. 1	12.00-12.50

MACHINE TURNINGS

Birmingham	4.25- 4.50
Boston, dealers	3.00- 3.25
Buffalo	7.00- 7.50
Chicago	6.50- 7.00
Cincinnati, dealers	4.75- 5.25
Cleveland	8.25- 8.50
Detroit	6.50- 7.00
Eastern Pa.	7.00- 7.50
New York, dealers	3.25- 3.50
Pittsburgh	9.50-10.00
St. Louis	4.25- 4.75
Valleys	10.00-10.50

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	1.75- 2.00
Buffalo	7.50- 8.00
Cincinnati, dealers	4.75- 5.25
Cleveland	8.25- 8.75
Detroit	7.25- 7.75
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.50
Pittsburgh	8.00- 8.50

CAST IRON BORINGS

Birming., plain	4.00- 4.50
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	7.50- 8.00
Chicago	7.00- 7.50
Cincinnati, dealers	4.75- 5.25
Cleveland	8.25- 8.75
Detroit	7.25- 7.75
E. Pa., chemical	12.00-15.00
New York, dealers	3.00- 3.50
Pittsburgh	8.00- 8.50
St. Louis	4.00- 4.50

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	6.25- 6.75
Chicago, net	7.00- 7.50
Cincinnati	5.25- 5.75
Eastern Pa.	8.50- 9.00
New York, dealers	5.00- 5.50
St. Louis	5.50- 6.00

FORGE FLASHINGS

Boston, dealers	5.00- 5.25
Buffalo	8.50- 9.00
Cleve., over 10 in.	9.25- 9.75
Detroit	7.75- 8.25

FORGE SCRAP

Boston, dealers	4.25- 4.50
Chicago, heavy	11.00-11.50
Eastern Pa.	10.50-11.00

ARCH BARS, TRANSOMS

St. Louis	9.75-10.25

AXLE TURNINGS

Boston, dealers	3.50- 3.75
Buffalo	7.50- 8.00
Chicago, elec. fur.	9.00- 9.50
Cleveland	9.00- 9.50
Eastern Pa.	11.00
St. Louis	5.00- 5.50

STEEL CAR AXLES

Birmingham	11.00-11.50
Boston, ship. point.	8.00- 8.50
Buffalo	11.00-11.50
Chicago, net	11.50-12.00
Eastern Pa.	14.00
St. Louis	11.50-12.00

SHAFTING

Boston, ship. point.	10.50-10.75
Eastern Pa.	16.25-16.50
New York, dealers	11.50-12.00
St. Louis	9.00- 9.50

CAR WHEELS

Birmingham, iron	9.00-10.00
Boston, iron deal	6.00- 6.50
Buffalo, iron	9.50-10.00
Buffalo, steel	11.50-12.50
Chicago, iron	10.50-11.00
Chicago, rolled steel	11.50-12.00
Cincinnati, iron	8.25- 8.75
Eastern Pa., iron	12.00-12.50
Eastern Pa., steel	14.00-15.00
Pittsburgh, iron	11.50-12.00
Pittsburgh, Steel	15.50-16.00
St. Louis, iron	8.75- 9.25
St. Louis, steel	11.50-12.00

NO. 1 CAST SCRAP

Birmingham	8.50- 9.50
Boston, No. 2	6.00- 6.25
Boston, tex. con.	10.50-11.00
Buffalo, cupola	10.50-11.50
Buffalo, mach.	11.50-12.50
Chicago, agri. net	8.50- 9.00
Chicago, mach. net	9.00-10.00
Chi., railroad net	8.50- 9.00
Cinci., mach. cup	9.00- 9.50
Cleveland, cupola	10.50-11.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.50-12.50
Pittsburgh, cupola	12.50-13.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.75- 9.25
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	6.50- 6.75
Buffalo, break.	8.50- 9.00
Cleveland, break.	8.00- 8.50
Detroit, break.	8.00- 8.50
Detrait, auto net	10.00-10.50
Eastern Pa.	11.00-11.50
N. Y., No. 1, deal	7.25- 7.75
N. Y., break. deal	7.25- 7.75
Pittsburgh	11.50-12.00

MALLEABLE

Boston, consum.	12.00-12.25
Buffalo	11.50-12.00
Chicago, R. R.	11.50-12.00
Cinci., agri. del.	8.00- 8.50
Cinci., R. R. del.	8.50- 9.00
Cleveland, rail.	11.00-11.50
Detroit, auto	9.50-10.00
St. Louis, R. R.	9.00- 9.50
Eastern Pa., R. R.	11.50-12.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.75-11.50
Boston, dealers	7.25- 7.50
Buffalo	9.75-10.25
Chicago	11.50-12.00
Eastern Pa.	13.00
New York, dealer	7.50- 8.00
St. Louis	11.25-11.75

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	8.75- 9.25

LOW PHOS. PUNCHINGS

Buffalo	11.00-11.50
Chicago	12.50-13.00
Eastern Pa.	14.00-15.00
Pittsburgh	15.50-16.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
Feb. 3	8.00	8.37½	7.75	50.65	50.95	4.00	3.90	4.30	*22.90	7.15	35.00
Feb. 5	8.00	8.37½	7.75	50.75	51.05	4.00	3.90	4.35	*22.90	7.15	35.00
Feb. 6	8.00	8.37½	7.75	51.12½	51.42½	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 7	8.00	8.12½	7.75	51.20	51.50	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 8	8.00	8.12½	7.75	51.30	51.60	4.00	3.90	4.40	*22.90	7.15	35.00
Feb. 9	8.00	8.12½	7.75	51.50	51.80	4.00	3.90	4.40	*22.90	7.15	35.00

*Nominal quotation. Market range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	☐
Baltimore* ..	2.75c
Boston††	2.90c
Buffalo	2.95c
Chattanooga..	3.26c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.00c
New York‡(d)	3.17c
Pittsburgh	2.85c
Philadelphia*	2.75c
San Francisco	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	☐
Portland	3.40c
San. Fran.	3.55c
Baltimore*	2.75c
Baltimore* ...	2.60c
Chattanooga..	3.26c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.75c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	☐
Boston 2.75c-3.25c	
Buffalo	1.95c
Chattanooga..	3.26c
Chicago 1.95c-2.10c	
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl...	3.10c
New Orleans	3.00c
New York	3.17c
Philadelphia..	2.62½c
Pitts., plain...	3.00c
Pitts., twisted squares	3.12½c
Seattle	3.50c
St. Louis	3.29c
Tulsa	3.25c
Young. 2.30c-2.60c	

SHAPES	☐
Baltimore* ...	2.60c
Boston††	3.07c
Buffalo	3.20c
Chattanooga..	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.75c
Pittsburgh	3.05c
Portland	3.40c
San Francisco	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3 25c
Tulsa	3.50c

PLATES	☐
Baltimore*	2.75c
Boston††	3.08c
Buffalo	3 20c
Chattanooga..	3.46c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼ in. and thicker.	3.21c
Cleve., ⅜-in.	3.20c
Detroit	3.30c
Det., ⅜-in.....	3.10c
Houston	3.00c
Los Angeles..	3.40c
New Orleans	3.50c
New York(d)	3.30c
Philadelphia*	2.75c
Phila. floor....	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	☐
Baltimore* ..	2.95c
Boston††	2.90c
Buffalo	3.10c
Chattanooga..	3.26c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Angeles..	3.65c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.95c
Pittsburgh	2.85c
San Fran.	3.75c
Seattle	3.65c
St. Louis 3.19c-3.36c	
St. Paul	3.45c
Tulsa	3 70c

NO. 24 BLACK	☐
Baltimore*†..	3.50c
Boston (g) ..	3.75c
Buffalo	3.25c
Chattanooga..	4.01c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Angeles..	4.15c
New York	3.65c
Philadelphia*†	3.40c
Pittsburgh**..	3.40c
Portland	4.25c
San Fran.	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	☐
Baltimore*†..	3.75c
Buffalo	4.00c
Boston (g) ..	4.35c
Chattanooga..	4.61c
Chicago 4.20c-4.30c	
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	4.40c
Los Angeles..	4.75c
New Orleans	4.35c
New York	4.25c
Pitts.** 3.90c-4.20c	
Portland	4.85c
San Fran.	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Phila.*†	4.00c

BANDS	☐
Baltimore	3.05c
Boston††	3.15c
Buffalo	3.30c
Chattanooga..	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Detroit, ⅜-in. and lighter	3.28½c
Houston	3.25c
Los Angeles..	3.80c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia..	3.05c
Pittsburgh	3.10c
Portland	3.90c
San Fran.	3.15c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS	☐
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det., No. 14 and lighter	3.28½c
New York	3.42c
Philadelphia..	3 30c
Pittsburgh	3.60c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	☐
Baltimore (c)	3.71c
Boston 4.00c-4.50c	
Buffalo (h)....	3.55c
Chattanooga*	4.06c
Chicago (h)..	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)..	5.95c
New Orleans	4.25c
New York...3.92c-4.42c	
Philadelphia..	3.73c
Pittsburgh(h)	3.45c
Portland (f)..	4.75c
San Fran. (f)	5.95c
Seattle (f)....	4.75c
St. Paul	3.20c
St. Louis.....	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	☐
Boston, 0.100-in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)..	5.65c
Cincinnati	5.80c
Cleveland (b)	5.55c
Detroit	5.40c
Philadelphia..	4.00c
New York.....	4.55c
St. Louis	5.74c

(b) Net base, straightening, cutting, boxing, 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus. quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, NewYork, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 8

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	
Foundry, 2.50-3.00 Silicon.	$14.63	2 18 6	$8.88	1 16 6
Basic bessemer.....	13.50	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05....	15.00	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets.....	$27.50	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage.....	39.00	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails.....	$38.75	7 15 0	$26.77	5 10 0
Merchant bars.....	1.56c	7 0 0	.72c	3 5 0
Structural shapes.....	1.64c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm.....	1.78c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.....	2.06c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr...	2.51c	11 5 0	1.54c	7 0 0
Bands and strips.....	1.78c	8 0 0	.85c	3 17 6
Plain wire, base.....	2.06c	9 5 0	1.18c	5 7 6
Galvanized wire, base.....	2.45c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base.....	2.68c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.....	$ 4.13	0 16 6	....	.....

British ferromanganese £85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5.....	$15.63	3 2 6(a)	$12.68	200	$13.66	305	$24.07	63
Basic bessemer pig iron....	16.25	3 5 0(a)*	11.73	185	12.99	290	26.55 (b)	69.50
Furnace coke.....	4.38	0 17 6	8.61	120	4.93	110	7.35	19.25
Billets.....	27.50	5 10 0	25.68	405	19.71	440	36.86	96.50
Standard rails.....	1.84c	8 5 0	2.03c	700	2.20c	1,100	2.28c	132
Merchant bars.....	1.70c	7 12 6	1.62c	560	1.10c	550	1.90c	110
Structural shapes.....	1.95c	8 15 0	1.61c	550	1.10c	550	1.86c	107.50
Plates, †¼-in. or 5 mm.....	1.90c	8 10 0	2.03c	700	1.40c	700	2.20c	127
Sheets, black.....	2.29c	10 5 0§	2.47c	850‡	1.55c	775‡	2.49c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	2.84c	12 15 0	4.21c	1,450	3.00c	1,500	6.40c	370
Plain wire.....	2.06c	9 5 0	3.28c	1,130	2.20c	1,100	2.99c	173
Bands and strips.....	2.34c	10 10 0	1.89c	650	1.40c	700	2.20c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 44

Pittsburgh—On certain analyses and finishes both carbon and alloy bars are in heavier demand but orders for merchant steel bars in general show slow improvement. Silico-manganese steel bars, for use on automobile springs, are active and it is estimated that probably 75,000 tons of silico-manganese billets will be required this year for this new spring part. Demand for other grades of alloy bars is picking up, mainly from the automotive field. Markets hold at 1.75c on carbon bars and 2.45c on alloy bars, with precision round hot-rolled bars also constituting a large portion of the going business.

Cleveland—Bar orders so far this month for some leading interests here exceed all their January tonnage, reflecting improvement in automotive and miscellaneous manufacturing requirements. This does not include any material for the 12,725 freight cars awarded last week by the Van Sweringen lines of which 1250 were placed with two Ohio builders, who expect to begin specifying within two weeks. The latter will require approximately 16,250 tons of rolled steel for their cars to be fabricated in their plants.

Chicago—Various consumers contribute to the rising demand for soft steel and iron bars. Specifications from automotive and farm implement industries are expanding steadily and miscellaneous consumers have increased their requirements. Bar iron demand has increased moderately with further gains in prospect for railroad use. Soft steel bars continue 1.80c, Chicago, with rail steel bars 1.70c and bar iron 1.60c, Terre Haute, Ind.

New York—Specifications for steel bars are light, pending distribution of railroad tonnages. Advancing prices restrict sales of imported material. Most of the latter now arriving is from France.

Philadelphia — Railroad tonnage dominates demand for commercial steel bars. Specifications against quarterly contracts entered into in December are coming out only moderately. New prices have been filed on double refined wrought iron, this material now 5c, Creighton, Pa. Commercial steel bars are unchanged at 1.75c Pittsburgh, or 2.08c, Philadelphia.

Toronto, Ont.—It has been reported here that the Dominion Steel & Coal Corp. has closed a contract for 6000 tons of steel rods which will be rolled at the Sydney, N. S., plant.

Plates

Plate Prices, Page 44

Pittsburgh—Last week Carnegie Steel Co completed rolling on about 1200 tons of plates at its Homestead, Pa., works for the two seagoing tankers New York Shipbuilding Co., Camden, N. J., is building for Standard Vacuum Co. River barge activity is slow and there is some question of barge design changes in view of code restrictions. Vicksburg, Miss., closes this week on two barges, 305 tons, but Kansas City engineers have postponed bids until Feb. 17 on 20 steel pontoons.

Cleveland—Plate mills here operated at 85 per cent last week on an accumulation of orders. Specifications are expected shortly on material for some of the 12,725 freight cars awarded by the Van Sweringen lines. It is understood it was stipulated Cleveland industries be patronized as much as possible in these purchases. Orders for 1250 of the freight cars and 5 locomotives and 20 extra tenders were placed with Ohio builders. Plate purchases by boiler and tank makers are light.

Chicago—Plate shipments are due for a substantial increase soon on buying for building of railroad cars placed recently. The largest recent tank order is for three elevated water tanks for Kansas City, Kans., requiring 500 tons.

New York—Platemakers are awaiting placing of railroad tonnages to give the market a needed lift.

Philadelphia — Recent improvement in miscellaneous buying of plates has been halted the past few days, with railroad tonnage by far the outstanding item pending. Orders for railroad tonnage over the next week or 10 days should amount to several thousand tons and include 6200 tons for the Pennsylvania railroad. Additional work for the navy for seven small airplane carriers should come out before the end of the month. Prices are unchanged at 1.80c Coatesville, or 1.88½c Philadelphia. However, new prices apply on seconds, effective since Feb. 1.

Contracts Placed

500 tons, three elevated water tanks, Kansas City, Kans., to Chicago Bridge & Iron Co., Chicago.

290 tons, 22-inch 14-gage pipe line, Metropolitan water district, Los Angeles; to Southern Pipe & Casing Co., Los Angeles.

200 tons, pipe line, Honolulu, T. H., for American Factors Ltd., to Central Iron & Steel Co., Harrisburg, Pa.

200 tons, two 200-horsepower boilers, Mare Island, Calif.; to Alta Electric & Mechanical Co., San Francisco.

130 tons, water tank, Aberdeen, S. Dak., to McClintic-Marshall Corp., Bethlehem, Pa.

120 tons, 300,000-gallon elevated tank, Borough of East Greenville, Pa., to Chicago Bridge & Iron works, Chicago.

120 tons, elevated steel tank, Kaukauna, Wis., to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

Contracts Pending

1702 tons, armor plate, bureau of ordnance, navy department, Washington; Bethlehem Steel Co. low on 1340 tons at $485 per ton; Midvale Co., Philadelphia, low on 324 tons at $420, and 38 tons at $605; material is for an airplane carrier now building.

305 tons, two mooring barges for Vicksburg, Miss.; bids Feb. 15.

200 tons, 20 steel pontoons for Kansas City engineers; bids postponed from Feb. 7 to Feb. 17.

200 tons, 500,000-gallon water tank for Two Rivers, Wis.; bids soon.

150 tons, main air header, Milwaukee sewage disposal plant; Cream City Boiler Co., Milwaukee, low bidder.

Unstated tonnage, 150,000-gallon elevated water tank, Aberdeen Proving Ground, Maryland; Pittsburgh-Des Moines Steel Co., low at $10,290.

Sheets

Sheet Prices, Page 44

Pittsburgh—The market is supported chiefly by automotive buying, in sufficient tonnage to provide 55 per cent operations in the sheet industry. There is little feature in the market for black sheets, galvanized or other common finishes. Prices are 2.75c, Pittsburgh, on cold-rolled; 2.25c on black; 2.85c on galvanized; and 1.75c on No. 10 gage hot-rolled.

Cleveland—Sheet mills here and in an adjacent lake district now are operating at capacity, due mainly to steady inflow of large specifications from automobile manufacturers. Demand from refrigerator, barrel and stove makers also has improved. In view of the rapidly mounting volume of business, and the fact sellers are prohibited by the code from booking more tonnage than they can deliver by the end of the quarter, some sheetmakers last week were insisting on receiving March specifications from automobile interests.

Chicago—Announcement of second quarter sheet prices, expected to be advances over present levels, is deferred. These are looked for prior to opening of books for the new period March 1. Business continues fairly active, aided to a large extent by good demand from the automotive industry. Producers have prospects for full operations in production of

automotive material well into the second quarter.

New York—Sheets are moving slowly, pending the usual spring improvement. Prices are steady.

Philadelphia—Apart from automotive buying, little improvement is noted in sheet business here. The trade here is uncertain as to what may be expected in the way of early changes in sheet prices.

Buffalo—Demand for sheets is strong. Local mills are reported to have sufficient tonnage on order to continue operating at 80 per cent of their capacity for an indefinite period.

Cincinnati—Sheet mills in this district report a broadening of demand, diversified industries being in the market. The automobile industry continues to buy heavily.

St. Louis—Producers and distributors of steel sheets report decided improvement in their business during the past ten days. The movement of galvanized material to the rural areas has picked up particularly in the South.

Railroads

Track Material Prices, Page 45

Rolled steel requirements for the 12,725 freight cars distributed last week by the Van Sweringen lines are estimated to total about 165,000 tons and total steel including wheels and axles, will be close to 275,000 tons.

From this award of cars, given in detail below, American Car & Foundry Co., New York, will be in the market for about 37,000 tons of rolled steel; Pullman Car & Mfg. Corp., Chicago, for about 15,000 tons; Standard Steel Car Co., Pittsburgh, 25,000 tons; Pressed Steel Car Co., Pittsburgh, 16,000 tons; General American Transportation Corp., Chicago, 30,000 tons; Ralston Steel Car Co., Columbus, O., 10,000 tons; Canton Car Co., Cleveland, 6500 tons; Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., 1350 tons, Bethlehem Steel Co., Bethlehem, Pa., 8775 tons; Ryan Car Co., Chicago, 3250 tons; Magor Car Corp., New York, 3000 tons, Greenville Steel Car Co., Greenville, Pa., 9750 tons.

For the 159 passenger cars awarded, steel requirements will total close to 4000 tons, of which American Car & Foundry Co. will need 1250 tons, Pressed Steel Car Co. 625 tons, Pullman Car & Mfg. Corp. 1425 tons and St. Louis Car Co. 625 tons.

Next important car buying is expected to be done by the Atlantic Coast Line, Chicago, Milwaukee, St. Paul & Pacific and Illinois Central. It seems likely a total of 30,000 cars will be bought before the present movement is over.

Distribution is expected momentarily on about 23,000 tons of plates, shapes, bars and sheets, 18,000 wheels and 3000 axles for the Pennsylvania, with action also imminent on approximately 7500 tons of steel, including 4250 tons of plates, shapes, bars and sheets, for equipment recently placed by Lehigh & New England. This comprised 500 freight cars, of which 250 box went to the Magor Car Corp., 150 hopper cars to the Pressed Steel Car Co., and 100 gondolas to the American Car & Foundry Co.

The tonnage specified by the Pennsylvania represents about a third of the total estimated requirements of the 6500 freight cars for which material is yet to be placed.

Bethlehem Steel Co. plans to start work shortly at its Cambria car shops, Johnstown, Pa., on 695 freight cars for the Nickel Plate railroad, its first schedule on rolling stock at the Cambria plant since 1929.

Westinghouse Air Brake Co., Wilmerding, Pa., last week received an order for a new design of air brakes for 7000 new freight cars from Pennsylvania railroad. Work on the order is starting immediately at Wilmerding, with shipments to be scheduled according to car assemblies at the Pennsylvania railroad's Pitcairn, Pa., Altoona, Pa., and Harrisburg, Pa., car shops.

Lehigh Coal & Navigation Co., Philadelphia, is reported to have placed 100 cast steel mine car under frames with General Steel Castings Co., Eddystone, Pa.

Chicago, Milwaukee, St. Paul & Pacific will spend proceeds of a PWA loan, for which it is asking interstate commerce commission permission, in the purchase of 25 all-steel baggage express cars, 50 passenger coaches and 30 high-speed locomotives, costing $5,720,000.

Southern Pacific has divided 40,000 tons of rails among Colorado Fuel & Iron Co., Denver, which was awarded 15,000 tons, Bethlehem Steel Co., Bethlehem, Pa., and United States Steel Corp., New York.

Chicago & North Western has received a PWA loan of $1,400,000 and is inquiring for 26,514 tons of rails, 4000 tons of tie plates and more than 2000 tons of other fastenings. Chicago & Eastern Illinois, with a loan of $240,000 granted by PWA, is asking bids on 4000 tons of rails and 1000 tons of tie plates. Chicago, Milwaukee, St. Paul & Pacific will buy 20,000 tons of rails and fastenings when a PWA loan of $2,066,852 is granted.

Detroit Street Railways are inquiring for 1500 tons of steel ties and probably will be in the market soon for an additional tonnage of steel rails.

Car Orders Placed

Erie, 3725 freight cars, 125 passenger cars, as follows: American Car & Foundry Co., New York, 500 box, 500 auto, 50-ton; Standard Steel Car Co., Pittsburgh, 750 50-ton steel hoppers; Pressed Steel Car Co., Pittsburgh, 750 50-ton steel hoppers; Greenville Steel Car Ca., Greenville, Pa., 750 50-ton hoppers; Ryan Car Co., Chicago, 250 50-ton steel hoppers, 125 70-ton flats; Magor Car Corp., New York, 100 40-ton furniture; American Car & Foundry Co., 50 semisuburban; Pressed Steel Car Co., 25 suburban; Pullman Car & Mfg. Corp., Chicago, 50 suburban.

Chesapeake & Ohio, 7800 freight cars, 50-ton capacity, as follows: American Car & Foundry Co., New York, 1000 gondolas, 850 hoppers, 50 automobile; Pullman Car & Mfg. Corp., Chicago, 650 box; Standard Steel Car Co., Pittsburgh, 1150 hoppers; Pressed Steel Car Co., Pittsburgh, 500 hoppers; General American Transportation Corp., Chicago, 2250 hoppers, Ralston Steel Car Co., Columbus, O., 750 hoppers; Canton Car Co., Cleveland, 500 hoppers; Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., 100 furniture; St. Louis Car Co., St. Louis, 15 coaches, 11 mail and express.

Nickel Plate, 1200 freight cars, 50-ton capacity, as follows; Pullman Car & Mfg. Corp., Chicago, 500 box; Bethlehem Steel Co., Bethlehem, Pa., 650 gondolas; Ryan Car Co., Chicago, 25 flats; Pullman Car & Mfg. Corp., seven coaches; St. Louis Car Co., one mail and express.

Lehigh & New England, 500 freight cars; 250 box cars to Magor Car Corp.; 150 hoppers to Pressed Steel Car Co., and 100 gondolas to American Car & Foundry Co.

Rail Orders Placed

Southern Pacific, 40,000 tons, divided between Bethlehem Steel Co., Bethlehem, Pa., Colorado Fuel & Iron Co., Denver, and United States Steel Corp.

Car Orders Pending

Alaska railroad, 20 hoppers, Koppel Industrial Car & Equipment Co., Koppel, Pa., low.

Erie, eight baggage and mail cars; bids Feb. 17.

Locomotives Pending

Pittsburgh & West Virginia, three locomotives, tentatively awarded to Baldwin Locomotive Works, Philadelphia.

Rail Orders Pending

Chicago & North Western, 26,514 tons in addition to 4000 tons of tie plates, 730 tons of spikes, 180 tons of track bolts, 1460 tons of rail joints and other miscellaneous accessories; PWA loan of $1,400,000 approved.

Chicago & Eastern Illinois, 4000 tons of rails in addition to 1000 tons of tie plates and other miscellaneous accessories; PWA loan of $240,000 approved.

Pipe

Pipe Prices, Page 45

Pittsburgh—Little improvement is noted in pipe specifications or shipments. Line pipe is inactive with immediate prospects vague. Boiler tubes are expected to be in fair demand for recent locomotive buying. Oil country goods for the Southwest show a minor improvement, mainly due to a clean up on used stocks there.

Cleveland — Jobbers are taking larger tonnages of pipe, this representing the most active feature of the market here.

Chicago—Cast pipe producers recently have received a few releases on orders placed over recent months. Shipment of this material had been held up by the lack of government approval of bids and specifications. The large volume of pending business assures producers of favorable operations as soon as such work may be released.

New York—Cast pipe buying and inquiry continues to lag, except for some small-lot buying for CWA projects. Prices are generally held at $40, eastern foundry, for 6-inch and over, standard cast pipe.

Birmingham, Ala.—Cast iron pipe awards are not numerous, although confidence is expressed in spring prospects.

Cast Pipe Placed

448 tons, pipe and fittings, Jamestown, N. Y., to United States Pipe & Foundry Co., Burlington, N. J., $23,172.57, delivered; award awaiting CWA loan, project being approved.

270 tons, 8 to 12-inch, CWA projects, New York, bulk to United States Pipe & Foundry Co., Burlington, N. J., balance to Warren Foundry & Pipe Co., Phillipsburg, N. J.

265 tons, 16-inch, class 250, Glendale, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

185 tons, bell and spigot, for Boulder dam power plant, Boulder City, Nev., to Pacific States Cast Iron Pipe Co., Provo, Utah.

Cast Pipe Pending

700 tons, watermains under Maumee river, Toledo, O.; inquiry withdrawn by Toledo city council.

600 tons, estimated 6 to 16-inch, Charlotte, S. C.; bids Feb. 15.

600 tons, 6, 12 and 30-inch, Baltimore; M. & J. B. McHugh, Philadelphia, low on general contract.

594 tons, 16-inch, class 100, Gilroy, Calif.; bids soon.

408 tons, 4 to 20-inch, with fittings, state hospital, Central Islip, Long Island, N. Y.

384 tons, 8 to 12-inch, class 150, Fresno, Calif.; new bids in.

225 tons, 6-inch, Bixby, Okla.

100 tons, 4 and 8-inch, class C, Daly City, Calif.; United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Pending

300 tons, 34-inch, ⅜-inch wall thickness, for army engineers, Kansas City, Mo.; bids postponed from Feb. 7 to Feb. 17.

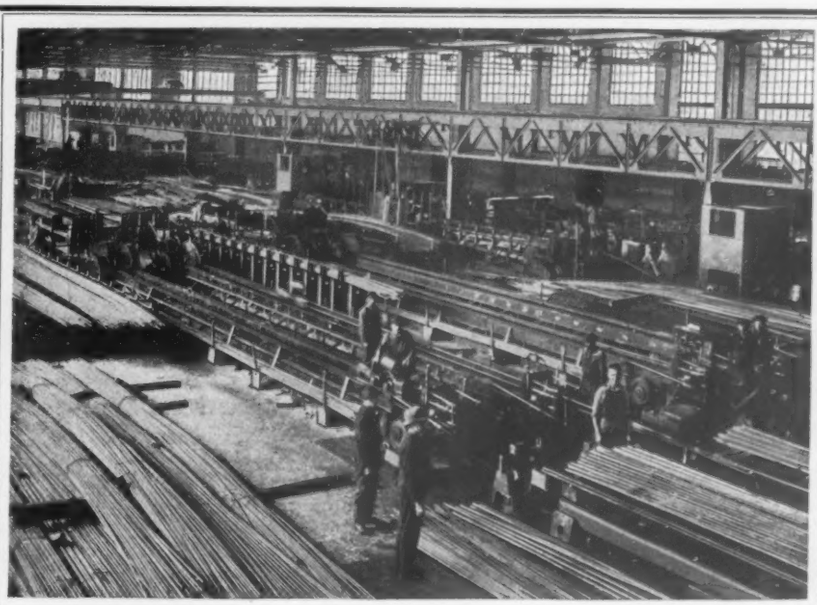
Unstated tonnage, 1500 feet, 20-inch I. D. rivet weld shore pipe for dredge WELATKA; bids in with United States engineer, Jacksonville, Fla.

Unstated tonnage, 1286 boiler tubes, bureau of supplies and accounts, navy department, for Norfolk, Va.; bids in.

Cold Finished

Cold Finished Prices, Page 45

Pittsburgh—Automotive buying of cold-finished steel bars was in heavier volume last week. The market is more active and will better the January rate for specifications and shipments. Base of 2.10c, Pittsburgh, continues on carbon cold-finished steel with alloy cold-finished steel 2.95c, Pittsburgh.



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For over forty years this great organization, with its many facilities, has interested itself in the problem of applying Cold Finished Bar Steels to Industrial purpose. This wealth of experience, as well as the facts developed through research, find themselves as part of the general character of our every shipment. It is this well-regulated character that makes our bar steels stand out foremost in a class by themselves.

Bliss & Laughlin, Inc.

Harvey, Ill. **Buffalo, N. Y.**

Sales Offices in all principal cities

Shapes

Structural Shape Prices, Page 44

New York—More small structural awards are being placed, with fabricators' bids showing a wide spread despite the firm price on plain material. Except for one northern New Jersey fabricator, shops are taking in little plain material. Including the 12,000-ton postoffice project, Manhattan, not more than 25,000 tons is active in this territory.

Cape May, N. J. will be in the market shortly for sheet piling for a $100,000 bulkhead. Requirements for the Camden approach to the high-speed line over the Delaware river bridge, amounting to 3000 tons of shapes and 2000 tons of piling, may be out late in February.

Pittsburgh—Ten projects including six large structural steel bridges at Pittsburgh are included in a $25,000,000 request by Allegheny county officials for PWA funds. More active structural inquiry includes 5400 tons for government radio towers. Plain structural shapes continue firm at 1.70c, base, Pittsburgh.

Cleveland—Fabricators here are bidding on small bridges in Ohio, eastern Pennsylvania and eastern New York, requiring a total of about 2000 tons of shapes. United States engineers at Cleveland expect to award 1750 tons of piling for a breakwater at Huron, O., within two weeks, bids being in.

Chicago—Shape awards are lighter, the outstanding order in this district being 1400 tons for the exhibit and assembly building of the Ford Motor Co., to be built at the World's fair. Other bookings are made up almost entirely of government and state bridges, the largest being at Fort Peck, Mont., requiring 2000 tons of shapes and 900 tons of piling. Inquiries include 2200 tons for Illinois state bridges, the largest being a 1500 ton structure at Henry, Ill. For an Illinois Central railroad bridge at Bonnet Carre, La., 1000 tons will be required.

Philadelphia — Pending formal award of 1500 tons for the Philadelphia approach to the high speed line over the Delaware river bridge, structural buying here is light. The Frederick Snare Corp., New York, is low bidder on the Choptank river bridge at Cambridge, Md., requiring 5000 tons. Action is still pending on tonnage for the Pennsylvania railroad's electrification program.

Contracts Placed

2900 tons, bridge, Fort Peck, Montana; 2000 tons of shapes to McClintic-Marshall Corp., Bethlehem, Pa.; 900 tons of piling to Bethlehem Steel Co., Bethlehem, Pa.

1784 tons, including 290 tons of machinery, Park street bridge, Oakland, Calif., to Moore Drydock Co., Oakland.

1425 tons, piling, lock No. 18, Mississippi river near Burlington, Iowa, to Inland Steel Co., Chicago; through Maxon Construction Co.

1400 tons, automobile exhibit and assembly building, Ford Motor Co., World's fair, Chicago, to R. C. Mahon Co., Detroit.

1164 tons, including 1100 tons of piling and 64 tons of shapes; all of shapes and 60 per cent of piling to Pacific Coast Steel Corp.; 25 per cent of piling to Columbia Steel Co.; and 15 per cent of piling to A. M. Castle Co., Seattle.

1100 tons, Pittsburgh postoffice ramps, to Fort Pitt Bridge Works, Pittsburgh.

750 tons, seaplane hangar, Coco Sola, C. Z., to Ingalls Iron Works Co., Birmingham, Ala.; general contract reported last week to H. B. Nelson Construction Co., Atlanta, Ga.

600 tons, bridge replacement and road elevation, Greene county, Mississippi, including 236-foot cantilever span; 300 tons to Virginia Bridge & Iron Co., Roanoke, Va., and 300 tons, 19-foot I-beams to Jones & Laughlin Steel Corp., Pittsburgh; W. C. Howton Contracting Co., Birmingham, general contractor.

435 tons, state bridges, Franklin and Phelps counties, Missouri, to Stupp Bros. Bridge & Iron Co., St. Louis.

430 tons, hangar and boiler house, Fort Benning, Georgia, to Ingalls Iron Works Co., Birmingham, Ala.

370 tons, state hospital buildings, Sonyea, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; W. E. O'Neil Construction Co., Chicago, general contractor.

350 tons, building group, state hospital, Albion, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.

350 tons, buildings, Fort Knox, Kentucky, to Bedford Foundry & Machine Co., Bedford, Ind.

325 tons, buildings, prison, Comstock, N. Y., to Belmont Iron Works, Philadelphia.

250 tons, piling for Santa Fe railroad bridges in Los Angeles, to unnamed interests; general contract to Sharps & Fellows, Los Angeles.

200 tons, specification 3302, Los Angeles, to Consolidated Steel Corp., Los Angeles.

175 tons, bridge, Springfield, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

160 tons, addition, squadron officers' school, Montgomery, Ala., to unstated fabricator; also 29 tons of bars and 40 tons of mesh to unstated fabricators; Algernon Blair, Montgomery, Ala., general contractor.

155 tons, grade crossing, Erie railroad, Elmira, N. Y., to R. W. McManus Structural Steel Co., Buffalo, N. Y.

154 tons, shapes and concrete bars, bridge over D. L. & W. tracks, Morris Plains, N. J., to McClintic-Marshall Corp., and Kalman Steel Corp., Bethlehem, Pa.

150 tons, bridge, Dunbar, Iowa, to Omaha Steel Works, Omaha, Nebr.

150 tons, bridge, Fairbanks, Iowa, to Clinton Bridge Works, Clinton, Iowa.

150 tons, Montgomery Ward & Co. building, San Bernardino, Calif., to Consolidated Steel Corp., Los Angeles.

150 tons, Long Island railroad grade separation, New York, to American Bridge Co., Pittsburgh; Andrew Weston Co. Inc., general contractor.

138 tons, two state crossings, Eagle and Huerfane counties, Colorado, to unnamed interests.

134 tons, two state bridges, Golden Valley and Carbon counties, Montana, to unnamed interests.

130 tons, Pennsylvania state highway bridge, Rahns, Montgomery county, Pa., to McClintic-Marshall Corp, Bethlehem, Pa.

125 tons, highway bridge, Missouri, to St. Joseph Structural Steel Co., St. Joseph, Mo.

130 tons, bridge, Tula, Mich., to McClintic-Marshall Corp., Bethlehem, Pa.

115 tons, garage and utility shop, Fort Monmouth, New Jersey, to Lafayette Iron Works, Brooklyn, N. Y.

110 tons, Buick service shop, White Plains, N. Y., to Levine Iron Works, Bronx, New York.

100 tons, shapes and concrete bars, Lake Hopatcong road, Morris county, New Jersey, to Phoenix Bridge Co., Phoenixville, Pa., with 13 tons of bars to Kalman Steel Corp., Bethlehem, Pa.

100 tons, shapes and concrete bars, officers' mess hall, Langley Field, Virginia, to Globe Iron Construction Co., Norfolk, Va., and Knoxville Iron Works, Knoxville, Tenn.; A. L. Goode Inc., Charlotte, N. C., general contractor.

100 tons, bridge, Memphis, Tenn., to Pidgeon-Thomas Iron Co., Memphis.

100 tons, bridge, Makanda, Ill., to Midland Structural Steel Co., Chicago.

100 tons or more, shapes and bars, museum, University of Virginia, to Deitrich Bros., Baltimore, and Concrete Steel Co., New York.

100 tons, shapes and bars, Long Island Railroad branch separation, Southern State Parkway, Suffolk county, New York, to National Bridge Co., Long Island City, N. Y.; Faircroft Engineering Co., Brooklyn, general contractor.

Shape Awards Compared

	Tons
Week ended Feb. 10	**15,549**
Week ended Feb. 3	**15,024**
Week ended Jan. 27	**15,990**
This week in 1933	**7,904**
Weekly average for 1933	**15,413**
Weekly average 1934	**16,749**
Weekly average January	**17,481**
Total to date 1933	**71,325**
Total to date 1934	**100,496**

Contracts Pending

5000 tons, state bridge over Choptank river, Cambridge, Md.; general contract to Frederick Snare Corp., New York. McClintic-Marshall Corp., Bethlehem, Pa., low for shapes. Also, 1700 tons of bars required.

3422 tons, piling, drum gates and powerhouses, Central Valley water project, California; bids soon.

2200 tons, seven state bridges, Illinois, including 1500-ton bridge at Henry, Ill.; bids Feb. 20.

2000 tons, six state bridges; bids opened at Harrisburg, Pa., Feb. 9, in accordance with previously published schedule.

1000 tons, stadium for Western Reserve

university and Case School of Applied Science, Cleveland; loan sought.
1000 tons, Illinois Central railroad bridge, Bonnet Carre, La.
630 tons, three Pennsylvania state highway projects; bids Feb. 23.
500 tons, bridge, Memphis, Tenn.
388 tons, Russian river bridge at Monto Rio, for Santa Rosa county, California; bids Feb. 9.
265 tons, also 60 tons of concrete bars, bridge for Erie railroad, North Randall, O.; bids being taken.
220 tons, Broadway tunnel, Oakland, Calif.; bids March 22.
175 tons, government hangar, Aberdeen, Md.
150 tons, bridge, Gordon Borough, Pa., for Reading Co.
Unstated, overhead crossing, Norton avenue, Everett, Wash.; bids soon.
Unstated, cranes for Puget Sound, Wash., navy yard; bids to be received at Washington.

Reinforcing

Reinforcing Bar Prices, Page 45

Pittsburgh—Bids from general contractors on several hundred tons of bars for Pennsylvania bridge projects closed Feb. 9. Otherwise the market is quieter. New billet steel for reinforcing holds at 1.90c, Pittsburgh.

Cleveland—Private building operations are lacking and comparatively little new CWA work is developing here. A small tonnage will be required for an Erie railroad bridge at North Randall, O., in addition to 265 tons of shapes, on which bide are being taken. Another state road letting has been announced for Feb. 16, requiring a moderate amount of reinforcing material.

Chicago—Delays still are encountered in closing on practically all of the larger projects in this and nearby districts. Bids have been taken on more than 1000 tons for construction in the Chicago sanitary district, but awards are lacking.

New York—Pending reinforcing steel bar volume, to be placed soon, is heavier. Close to 500 tons, on which bids are in, is required for a building at the military academy, West Point.

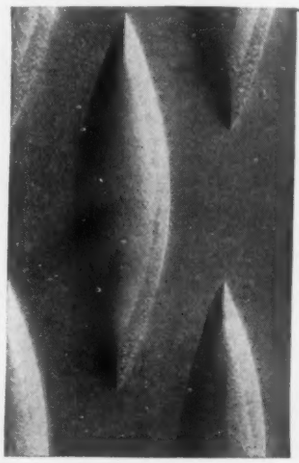
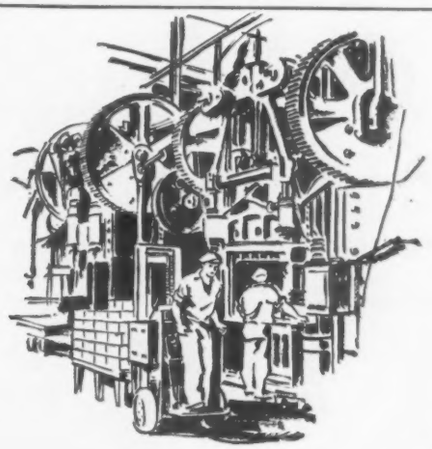
Philadelphia — Reinforcing bars are moving slowly, with a fair tonnage of miscellaneous bridge work up for early action. The largest project in this district, the Choptank river bridge at Cambridge, Md., 1700 tons, will be placed shortly.

Contracts Placed

300 tons, Ellis Island, New York, seawall, to Joseph T. Ryerson & Sons Inc., New York; through A. M. Hazell Inc.
500 tons, lock No. 18, Mississippi river, near Burlington, Iowa, to Inland Steel Co., Chicago; through Maxon Construction Co.
441 tons, easterly approach of San Francisco-Oakland bridge, to Soule Steel Co., San Francisco.
238 tons, Panama canal, schedule 2935, opening Jan. 21, to Laclede Steel Co., St. Louis.
250 tons, mesh, highway, Saratoga county, New York, to American Steel & Wire Co., New York; through Davis & Sterns Inc.
220 tons, bridge replacement and road

Concrete Awards Compared

	Tons
Week ended Feb. 10	2,684
Week ended Feb. 3	2,227
Week ended Jan. 27	2,934
This week in 1933	3,039
Weekly average for 1933	3,771
Weekly average, 1934	4,060
Weekly average, January	4,862
Total to date 1933	24,777
Total to date 1934	24,360

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elevation, Greene county, Mississippi, to Truscon Steel Co., Youngstown, O.; W. C. Howton Contracting Co., Birmingham, Ala., general contractor.

150 tons, Boulder dam, specification A-3324-A, Boulder City, Nev., to Colorado Fuel & Iron Co., Pueblo, Colo.

147 tons, El Sereno valley storm drain, Los Angeles, to Pacific Coast Steel Corp., Los Angeles.

120 tons, school, Beckenridge, Minn., to Cowin Steel Co., Minneapolis; C. H. Peterson, Minneapolis, general contractor. Minneapolis Steel & Machinery Co. awarded 55 tons of structurals.

118 tons, state highway work in Tulare county, California, to unnamed interest.

100 tons, Montgomery Ward & Co. building, San Bernardino, Calif.; to unnamed interest.

100 tons, Fourth avenue South paving project, Seatfle, to unnamed interests.

Contracts Pending

2210 tons, Broadway tunnel, Oakland, Calif.; bids March 22.

1700 tons, state bridge over Choptank river, Cambridge, Md.; Frederick Snare Corp., New York, general contractor.

1143 tons, Nogales flood control project, El Paso, Tex.; T. A. Allen Construction Co., Los Angeles, low for general contract.

700 tons, Chicago sanitary district tunnel; Nash Bros., Chicago, low on general contract.

400 tons, state and highway projects, New York; W. W. Construction Co., New York, general contractor for three projects.

290 tons, three Pennsylvania state highway projects; bids Feb. 23.

245 tons, two state bridges in Santa Barbara county, California; bids Feb. 21.

117 tons, bridge in Mohave county, Arizona, for state; bids Feb. 20.

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Strip Steel

Strip Prices, Page 45

Pittsburgh — Several automotive buyers of strip steel have been pressing for deliveries and rolling schedules at Pittsburgh have been advancing. Demand is well distributed among both hot and cold-rolled and stainless strip. The market continues 1.75c, Pittsburgh, for hot-rolled strip and 2.40c, Cleveland or Pittsburgh, for cold-rolled. Pittsburgh mills are now obliged to meet a $1 a ton lower base price in the West, competing with the new 1.80c, Chicago, base on hot strip. This has not affected the Detroit market which, under the operation of resolution 13, continues 1.95c, Detroit, on hot-rolled.

Cleveland—Strip sellers feel a reaction from the reduction of $1 a ton in hot-rolled material at Chicago. While the price has not been reduced here, consumers are pressing for a similar reduction, and in some instances holding orders back.

Chicago—Reduction of $1 a ton to 1.80c, Chicago, for hot-rolled strip, effective Feb. 15, is expected to be only temporary, as higher levels are anticipated for second quarter. No change has been announced in cold-rolled strip, which continues 2.40c, Pittsburgh-Cleveland.

Boston — Improvement in cold-rolled strip demand lags behind the recent gains in round wire, although a gradually better buying movement is developing, largely from automobile parts manufacturers. Cold strip is firm at 2.60c, Worcester.

New York—Strip tonnage is off slightly from a week ago, with no change in prices.

Philadelphia—Calculations of the strip trade here have been somewhat upset by the $1 reduction in hot-rolled strip at Chicago. Whereas recently an early advance was contemplated in some quarters, there is now some question as to what the next development will be in the East.

Pig Iron

Pig Iron Prices, Page 46

Chicago — Reflecting improved foundry operations, shipments so far this month average more than 20 per cent ahead of the rate during the corresponding January period. Farm implement manufacturers have contributed materially to gains in the total melt. New business also is improving with a number of foundries re-entering the market for additional supplies. The market continues $17.50, furnace, for No. 2 foundry and malleable with second quarter levels yet to be determined. Southern foundry iron containing 0.70 and less phosphorus now is sold at the same delivered price as northern iron. Grades of higher phosphorus content continue 38 cents a ton below the northern delivered price.

Pittsburgh—Merchant pig iron market, especially for foundry grades, is featureless, but some activity is noted on basic shipments for several nonintegrated steel producers here. No early change is in prospect for prices in this district with $17.50 remaining quoted on basic, $18 on foundry, $18.50 on bessemer grades.

Cleveland—Foundry operations are continuing to increase as evidenced by more frequent calls for quick delivery of pig iron and coke. Comparatively few inquiries and contracts are noted. A leading merchant producer with headquarters here booked around 5000 tons in the week. It is understood General Motors will not be in the market for pig iron until April, having considerable stock on hand on last year's contract.

Boston—Recent sales of Dutch iron to New England textile plants have been lower than generally reported. Purchases have been made, however, under domestic prices, or by the waiving of silicon differentials.

New York—Purchasing of pig iron is inactive, although the foundry melt is improving moderately.

Philadelphia—Sales continue spotty, with sellers looking for no appreciable improvement much before the end of this month, when an advance may be named on new tonnage for delivery over the succeeding four months.

Buffalo—Melt continues to increase steadily and purchases are expected to reach substantial volume shortly. Five furnaces continue in production here.

Birmingham, Ala.—Sales continue in small lots, with the aggregate for the week slightly higher than recently. Estimates indicate Alabama furnaces will produce upward of 1,500,000 tons of iron this year.

Cincinnati—Although sales are being held to small tonnages, orders are appearing from foundries long idle. An improvement in the machine tool trade is indicated.

St. Louis—A moderate increase is noted in shipments. Outlook for basic iron has improved considerably.

Toronto, Ont.—Demand for pig iron has increased. Prices are firm.

Scrap

Scrap Prices, Page 47

Pittsburgh—The market appears strong in view of a growing willingness of mills here to take railroad heavy melting steel at as high as $14.50. For No. 1 heavy melting steel and hydraulic compressed sheets, a district mill bought a few

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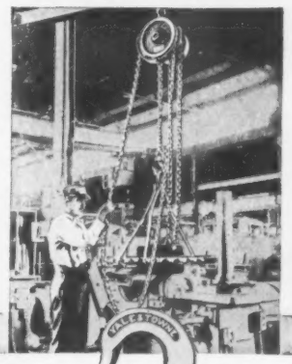

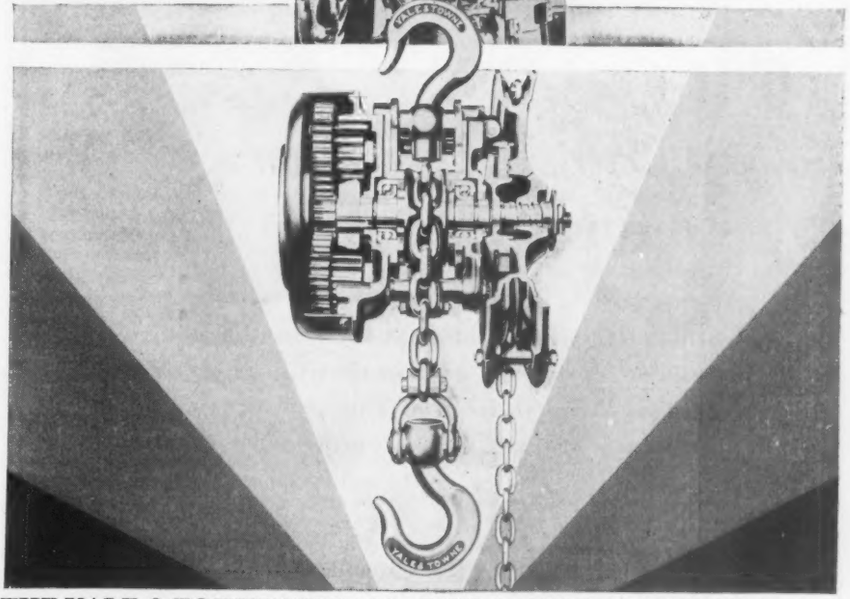

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thousand tons here last week at $13.50. As high scrap prices prevail at Detroit and other producing centers, it is becoming increasingly evident that Pittsburgh mills must depend upon railroad scrap for their supplies. Baltimore & Ohio sold its January list last week at over $14, delivered, to two district mills an advance of $1 a ton from a month ago. The Pennsylvania list Friday brought close to $14.50 for heavy melting steel, $14.10 for rails, and $15.50 for specialties for consumption in this district.

Cleveland—Recent purchase of 20,000 tons of heavy melting steel and other open-hearth grades through a Pittsburgh broker at $13.50, delivered, for a mill at Lorain, O., coupled with willingness of a Cleveland mill to buy heavy steel scrap in the open market to supplement its regular railroad source of supply, combine to give the market great firmness.

New York—Scrap prices are firm with rails for rolling and shafting slightly higher. Sentiment has improved. Steady, but not large shipments are being made to consumers in this district. Buying for barge loading for export continues with a large inquiry out for both grades of heavy melting steel for Japan and Italy.

Chicago—Expanding consumption points to an early increase in scrap demand. Mills are purchasing only small lots. Available supplies are relatively light, due partly to small offerings by railroads. Heavy melting steel continues $10.50 to $11, while quotations of a few railroad grades are higher.

Boston—New England consumers of heavy melting steel generally failed to follow premium prices for outside shipment and prices are slightly easier. For tonnage, the Worcester consumer is paying $9, delivered, for No. 1.

Philadelphia—Domestic scrap buying continues light, but strength is imparted by continued active export demand. No. 1 steel for eastern Pennsylvania delivery continues at $11.50 to $12, and other leading grades are also unchanged. Shipments are still being held up on No. 1 steel for Coatesville, Pa.

Detroit—Further price advances lift the market to the level of $9.50 to $10 for No. 1 heavy melting steel and hydraulic compressed sheets. Cast grades are particularly strong, due to increased demand. Open-hearth grades are moving up in sympathy with stronger outside markets. Sentiment for first half continues exceedingly bullish.

Buffalo—Dealers have advanced principal grades of scrap as much as $1 a ton. Scrap is firmly held and production has dropped sharply because of the coldest weather in two decades.

Cincinnati — Nominal quotations on iron and steel scrap are continued unchanged with some test of prices foreseen in pending railroad lists.

St. Louis—Iron and steel scrap prices continue strong with further specific advances on several items. The only purchase of note was 5000 tons of selected melting steel by an east side mill, which has been idle for many months but will shortly resume operations.

Birmingham, Ala. — Melters of scrap are purchasing in limited quantities and quotations remain firm.

Toronto, Ont.—Trading in iron and steel scrap is largely confined to iron grades, but inquiries for steel scrap are appearing from British buyers. Cast scrap is the most active, while new interest is developing in wrought iron and sales are reported in malleable and stove plate.

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Wire

Wire Prices, Page 45

Pittsburgh—Base of 3.60c on heavy round and oval-drawn wire. Pittsburgh, is now in effect. Other wire product prices continue unchanged but a general second-quarter advance is not unlikely.

The market is still quiet although some rural buying is appearing. The manufacturing trade is well stocked. New York Cordage & Cable Co. is low bidder at $1539 for 2850 feet of plow steel wire rope for army engineers at Pittsburgh.

Chicago—Heavier automotive releases help to raise wire shipments well above the rate a month ago. Needs of miscellaneous consumers of manufacturers' wire also are expanding gradually. Second quarter prices have yet to be determined, the market continuing $2.40, Chicago, for wire nails, and 2.25c for plain wire.

Cleveland—The market is more active, with heavier specifications reflected in improved mill schedules. While automotive orders predominate, general manufacturing requirements here have gained considerably so far this month.

Boston—Wire demand is broader and more active, the improvement covering round wire for manufactur-

ing and specialties, several price changes being noted on the latter. Plain bright wire is unchanged at 2.30c, Worcester, Mass.

Warehouse

Warehouse Prices, Page 48

Pittsburgh—Shipments from warehouse are slow and the first week of February has shown no improvement over a dull January. Prices are steady.

Cleveland—Volume of sales so far this month is slightly less than in the comparable period last month. Some warehouse interests, however, report more consumers are buying, and the number of orders ahead of last month.

Chicago—Small gains are noted in sales, the comparison with January being more favorable than that with the preceding week. Buying is more diversified.

New York—Several warehouse distributors note a slight improvement in volume while others hold close to the January rate. Buying is well spread.

Philadelphia—Warehouse trading is being sustained at the moderate rate of the past fortnight.

Detroit—February demand for warehouse steel holds up well with number of orders increasing. Prices are unchanged and firm.

Cincinnati—Steady upward trend in demand for steel from warehouse noted during January has abated. Prices are unchanged.

St. Louis—Moderate improvement is noted in distribution of iron and steel from warehouses since the end of January. Purchasing is more diversified both as to buyers and commodities.

Semifinished

Semifinished Prices, Page 45

Sheet bar demand increased slightly last week. An inactive skelp market reflects the low rate of operations at tube mills. Sheet bars, billets and slabs continue $26, Pittsburgh, with wire rods $36.

Chain

New York—Baldt Anchor Chain & Forge Corp., Chester, Pa., is low on chain and swivels for the navy department, at $60,580.74, delivery at eastern yards, Camden, N. J., and Fore River station, Mass. Bids Jan. 26.

Tin Plate

Tin Plate Prices, Page 44

Pittsburgh—Tin plate mill operations this week will be up 25 points to 60 per cent. A leading producer begins scheduling 12 turns weekly Feb. 12, and other producers are experiencing similar advances, due to resumption in buying by canmakers.

The market is $5.25 per base box, Pittsburgh.

New York—Heavy specifications by the two leading canmakers features the market for tin plate.

Ferroalloys

Ferroalloy Prices, Page 46

Specifications for domestic spiegeleisen so far this year are larger than in the corresponding period last year. Ferroalloy prices are unchanged.

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Pacific Coast

Pacific Coast Prices, Page 45, 46, 48

San Francisco—(*By Air Mail*)—Although few new inquiries of importance came up for figures during the week, awards were numerous and aggregate tonnage placed was large.

Awards of reinforcing bars were the second largest of the year, close to 2300 tons. Soule Steel Co., San Francisco, booked 441 tons for the easterly approach of the San Francisco-Oakland bridge. Pacific Coast Steel Corp. secured 147 tons for a storm drain in Los Angeles. Bids will open March 22 for 2210 tons for the Broadway tunnel, Oakland, Calif. Bids will be taken Feb. 21 for two bridges in Santa Barbara county, California, involving 245 tons.

Southern Pipe & Casing Co. booked 290 tons for a 22-inch pipe line for the metropolitan water district, Los Angeles. Central Iron & Steel Co. took 200 tons of plates for a pipe line in Honolulu, T. H., through American Factors Ltd. Alta Electric & Mechanical Co., San Francisco, booked 200 tons for two 200-horsepower boilers for Mare Island, Calif.

Structural shape awards also were the largest this year, 4179 tons. Moore Drydock Co. took the largest award, 1784 tons for the Park street bridge in Oakland, Calif.

Consolidated Steel Corp. secured 200 tons for the Corporation Yard, Los Angeles, and 150 tons for Montgomery Ward & Co.'s building in San Bernardino, Calif. New Inquiries include 3500 to 4500 tons for 18 to 22 radio towers for Summit, C. Z., and Pearl Harbor, T. H. New bids were opened Feb. 9 for 388 tons for the Russian river bridge at Monto Rio, Calif. The Broadway tunnel, Oakland, Calif., will take 220 tons.

United States Pipe & Foundry Co. secured the only large award of cast iron pipe, 265 tons of 16-inch, for Glendale, Calif. This company was also low on 100 tons for Daly City, Calif. Fresno, Calif., opened new bids Feb. 8 for 384 tons of 8 to 12-inch pipe.

Good Tonnages Pending

Seattle—Increasing activity is noted throughout the Pacific Northwest as public funds begin to move.

First steel awards for the Seattle seawall improvement were made this week, 1100 tons of sheet steel piling and 64 tons of structurals. Bids on piling were 2.47½c and low bid on angles 2.27½c. Pacific Coast Steel Corp., Seattle, took the structurals and 60 per cent of the piling, the remainder being awarded to Columbia Steel Co. and A. M. Castle & Co. on basis of 25 and 15 per cent, respectively. For the Fourth avenue South, Seattle, paving, a state project, 100 tons of reinforcing and steel mesh were awarded to unnamed interests.

The largest tonnages pending include 2300 tons of reinforcing for the Ambursen dam, of the Bonneville project, Johnson Bros., Seattle, general contractors not yet having placed the subcontract.

Stabilization of the dollar is expected to stimulate Japanese interest in scrap. Mills in Japan are reported stocked for 60 days but buying at higher levels is expected as ocean freights have advanced $1 and are now $3.50 for scrap. Japan has bid $8.50 gross, f.a.s., for No. 1 heavy melting, box size, while $10 can be obtained for 60-pound straight rails.

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Metals

Nonferrous Metal Prices, Page 46, 47

New York—Activity in the nonferrous metals was spotty last week with price changes only minor.

Copper—Fair buying was done early in the week but demand dwindled later on reports that code negotiations had come to an end for the time being. A code may be set up by the government applying only on labor conditions and wage rates. Electrolytic copper closed the week at 8.00c, Connecticut, despite dullness.

Zinc—Prices firmed up somewhat with sellers generally asking 4.40c, East St. Louis, for prime western. Demand was quiet. Stocks increased more than 6000 tons in January.

Tin—The trend in Straits prices was slightly upward with the average above 51.00c. Buying was slow but may be stimulated by increasing tin plate operations.

Antimony—The market was fairly steady but inactive on the basis of 7.15c for spot.

Aluminum—Virgin metal continued available at 19.00c to 22.90c for 98-99 per cent grade. Secondary No. 12 advanced to 15.00c to 15.50c.

Coke By-Products

Coke By-Product Prices, Page 45

New York—Demand for benzol and toluol, mainly against contracts, is slightly heavier, anticipating greater activity among automobile finishers. Phenol and sulphate of ammonia are unchanged in price and demand.

Quicksilver

New York—Quicksilver prices have advanced sharply due chiefly to a marked rise in quotations abroad which brought the equivalent of foreign metal to $71.50 a flask, duty paid here. Round lots are available at $70, a virgin flask of 76 pounds, and small lots at $71, with some sellers naming $72 on the latter.

Bolts and Nuts

Bolt, Nut, Rivet Prices, Page 45

Railroad purchases at Chicago and Pittsburgh so far have been reflected slightly in the bolt, nut and rivet market. Jobbers continue to buy sparingly. Consumption among miscellaneous users and in the automotive and farm implement industries is making slow, steady progress.

Cleveland producers find demand improving from all classes of consumers. Automotive releases are considerably larger but indicate that production schedules are not yet up to expectations. Somewhat heavier orders from railroads are noted.

Pennsylvania railroad, which has not yet distributed anticipated orders for 2000 tons of rivets and an unstated tonnage of bolts and nuts, is now inquiring tentatively for corrosion-resistant material for electrification work, including bolts, forgings and clamps.

Coke

Coke Prices, Page 45

Revised prices on Connellsville coking coal and other western Pennsylvania soft coal grades were announced Feb. 8 by the code authority of western Pennsylvania, resulting in higher prices on certain sizes. Connellsville beehive furnace coke is quoted $3.50 and medium sulphur furnace coke $3.25. Foundry grades continue based on $4.25, Connellsville, for common brands and $5, same base, for premium.

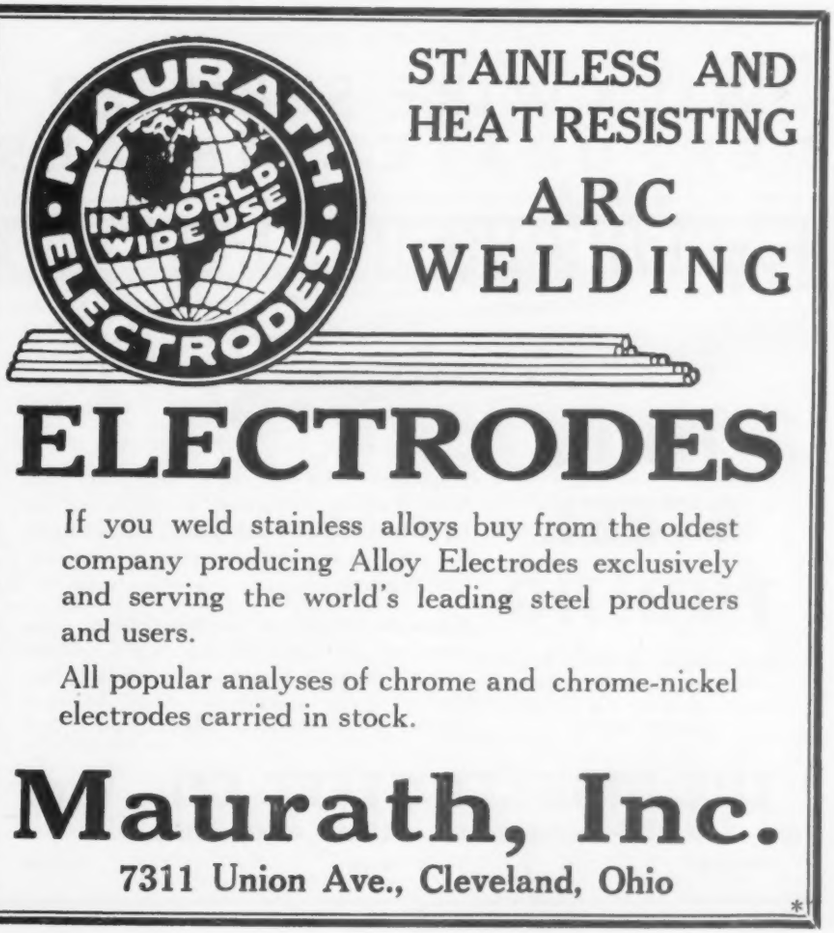
Foundry coke shipments at Chicago average 40 to 50 per cent heavier than a month ago and compare favorably with movement in February last year. Greater foundry activity has stimulated demand and reduced stocks. Prices are unchanged at $8.50, ovens, for outside delivery and $9.25, delivered, Chicago.

Steel in Europe

Foreign Steel Prices, Page 48

London—(*By Cable*)—An increase in the price of pig iron is expected to result from higher prices of coke. Belgian coke imports now are reported to be making up deficiencies in domestic coke supply. Dorman, Long have blown in an additional blast furnace. The Midland market is quieter and works are well occupied. Galvanized sheet domestic demand is fair, but exports are slow. Automobile builders are actively using special steels. South Wales has shipped a consignment of steel rails to the Far East.

The Continent reports export trade is quiet. Japan has placed some tonnage orders for sheets with European makers.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Construction and Enterprise

New England

HAMDEN, CONN.—R. F. Collins, chairman school commission, will soon take new bids on a two-story steel high school on Dixwell avenue, costing $700,000. R. W. Foote, 185 Church street, New Haven, Conn., is the architect.

CLINTON, MASS.—Clinton Gas Co., R. E. Freel, manager, 212 High street, plans rebuilding factory and machine shop, 464 High street, damaged by fire. Plans are private. Clinton Machine Works, 460 High street, lessee. The cost will exceed $28,500.

WORCESTER, MASS. — American Steel & Wire Co., 94 Grove street, is planning the construction of a brick, concrete, steel factory addition at a cost of more than $40,000. Private plans by M. R. Fish, engineer of owner, 94 Grove street.

New York

JAMESTOWN, N. Y.—Jamestown Metal Desk Co. has taken recent contracts for more than $1,250,000 of its product, assuring capacity operation for the next 12 months.

Pennsylvania

HARRISBURG, PA.—Bids will be received until Feb. 14 for construction of garage, 60 x 165 feet, and office 39 x 51 feet, at St. Marys, Elk county, Pa. Pennsylvania department of highways is preparing plans.

PITTSBURGH—Part of the plant of the Crucible Steel Co. of America, Thirty-fifth street and Allegheny Valley railroad, was severely damaged by fire Feb. 2.

Michigan

JACKSON, MICH.—Glick Iron &

IN TERMS OF SERVICE

SATISFACTORY Perforated Metal is not just so many pounds of sheet or plate with holes in it. You buy it to do a specific job and should measure the cost by length and degree of service. You have the right to expect and to receive engineering service as well as poundage. With Wickwire Spencer Perforated Metals you get—first, an engineering service to assist i n choosing the right specifications for the job to be done; and second, prompt delivery of a perforated product that fulfils your every requirement—however exacting. Our complete production facilities and engineers are at your service. Call on them!

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Wickwire Spencer Steel Company, 41 East 42nd Street, New York City; Buffalo, Chicago, Detroit, Philadelphia, Tulsa, Worcester; *Pacific Coast Headquarters:* San Francisco; *Warehouses:* Los Angeles, Seattle, Portland. *Export Sales Department:* New York City.

WICKWIRE SPENCER
PERFORATED METALS

NONSHRINK OIL HARDENING

TOOL STEEL TUBING

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

A saving will be realized by using our Tool Steel Tubing. Carried in stock up to 12″ O.D. x 2″ wall thickness. It is excellent for all classes of dies, slitters, spacers, bushings, etc.

We also supply a special tubing conforming in analysis to S.A.E. 52100 and S.A.E. 4615 designed particularly for Ball Bearing purposes. Can be furnished in Hot Rolled or Cold Drawn finish.

THE BISSETT STEEL CO., Inc.
945 East 67th St., CLEVELAND, OHIO
Cincinnati Pittsburgh Buffalo

Equipment

Chicago—Equipment and machinery activity continues to show slight gains. Freight car builders in this district are not expected to require any additional equipment of a major nature although some miscellaneous facilities will be required following the placing of recent car orders. Steel plants are making only moderate purchases of machinery but are more active in their demand for such products as rolls and ingot molds. Machine tool sellers note only a slight pick-up in demand in this district but report gradual improvement in nation-wide sales.

Pittsburgh—Heavier orders for steel mill equipment are in prospect and forecast activity in the market in the near future. Among work contemplated are several installations of mills for producing wide sheets. A hot strip mill for a Detroit buyer likely will be placed soon but a hot and cold-rolled strip mill for a Buffalo manufacturer does not appear promising. The steel mill roll market last week was interested in a report that a large steel producer in the Midwest, which ordinarily makes rolls only for its own use, had entered the open market in Ohio.

Boston — One Worcester, Mass., district machine tool builder has close to 50 tools on order. This is exceptional activity, but most New England machine shops are showing gradual gains in operating schedules.

New York—Inquiry for machinery has held its recent gains and a fair volume of business is being placed, including some export orders. Dealers with offices here report their plants more active in several instances, but largely on business taken in the midwest.

Cleveland—Orders for machinery and equipment are maintaining fair volume, well over the rate of a year ago. Machine tool buying by Detroit automotive interests is a feature, while a steady flow of small orders is noted from other industries.

Metal Co. has been incorporated by Louis Glick, 709 Adrian avenue, with 10,000 shares of no par value, to deal in iron and steel scrap.

Indiana

LAWRENCEBURG, IND.—E. A. O'Shaughnessey, care J. Walsh & Co. in planning the construction of a distillery and plant to exceed $28,000.

Illinois

AURORA, ILL.—City has applied for PWA loan of $50,000 for waterworks improvements, including distribution system, 1,500,000-gallon tank on steel tower, 4,000,000-gallon concrete reservoir and pumping equipment.

CHICAGO—Radi-Kool Corp., 1531 South State street, has been incorporated to develop, patent and manufacture gas valves and other devices, by Burry, Johnstone, Peters & Dixon, correspondents, 105 South LaSalle street.

DIVERNON, ILL.—City will receive bids about March 1 on water system including connection with feeder main from Springfield, local distribution lines, hydrants, valves, pumps, and tank on tower. A loan of $63,000 has been approved by PWA. Caldwell Engineering Co., Jacksonville, Ill., is engineer.

GIBSON, ILL.—Gibson Cannery Co. is planning to build a distillery, to cost $55,000 or more.

LAKE FOREST, ILL.—High school, district 113, G. J. McBride, president, voted bonds on a three-story steel high school to cost $350,000. M. C. Chatten, 160 North LaSalle street, Chicago, is architect, and Anderson & Ticker, Lake Forest, associate architects.

PAWNEE, ILL.—City will receive bids about March 1 for a water distribution system, including force main to connect with feeder line from Springfield, local distribution mains, fire hydrants, valves and boxes, pumps, tank on tower. A loan of $74,000 has been allotted by PWA. Caldwell Engineering Co., Jacksonville, is engineer.

Southern

MARION, ALA.—Town is planning to install a 200,000-gallon elevated steel tank, valves, hydrants and meters to improve its present pump house. The estimated cost is $42,640. John M. Gilfillan & Associates, 617 North Tenth street, Birmingham, are consulting engineers.

MUSCLE SHOALS, ALA.—Tennessee Valley Authority, Knoxville, Tenn., has awarded contract to Stone & Webster Engineering Corp., 90 Broad street, New York, for the addition of an experimental fertilizer plant to nitrate plant 2. The estimated cost is $50,000. D. C. Powers is local construction superintendent. Excavation for foundation work has started.

PLEASANT GROVE, ALA.—Town plans installing one 50-gallon-per-minute, centrifugal booster pump, one 75,000-gallon elevated steel reservoir, valves and meters. The estimated cost is $55,000. John M. Gilfillan & Associates, 617 North Tenth street, Birmingham, are consulting engineers. Application for a loan has been filed with PWA.

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids until Feb. 16 on specification 1714, four motor-driven sewing machines for delivery at Mare Island, Calif.; specification 1717, one motor-driven universal tool-grinding machine, for delivery at Puget Sound, Wash.

WINCHESTER, KY. — Robert Brooks Taylor, Lexington, Ky., has acquired a building on East Washington street which he will remodel into a brewery of 100,000 barrels capacity. He recently incorporated the Bluegrass Brewery with capital of $350,000.

HARRISONBURG, LA. — Application for a loan of $90,000 has been made by the city for construction of a water, light and ice plant. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., are engineers.

MONROE, LA.—RFC has approved loan of $55,000 for completion of municipal water works system for West Monroe, La.

BALTIMORE, MD. — Consolidated Gas, Electric Light & Power Co. is planning a $1,000,000 transformer station in connection with Pennsylvania railroad electrification program.

BALTIMORE, MD. — Consolidated Engineering Co., 20 East Franklin street, has contract for a one-story pumping station, 60 x 65 feet, at Ashburton, Md., costing $152,000.

SYKESVIILE, MD.—State board welfare, Springfield state hospital, is having plans made by H. P. Hopkins, 10 East Mulberry street, Baltimore, Md., for a two-story hospital to cost $100,000. Bids will be taken early in the spring.

GREENSBORO, N. C. — J. H. Walthal, Maryville, Tenn., has leased the Boone Water Power Mill six miles east of Greensboro and plans to install machinery for the manufacture of corn starch.

FAYETTEVILLE, N. C.—City is planning terminal facilities on Cape Fear river, which include a steel wharf barge 35 x 110 feet, a dock house 60 x 120 feet, and conveyors and railroad siding. Walter F. Schulze, Memphis, Tenn., is consulting engineer.

CHATTANOOGA, TENN. — Roane Iron & Coal Co. has been organized to take over and reopen the plant of the Roane Iron Co., located at Rockwood, Tenn. J. Kent Boyd, for many years manager of the Wheeling Mfg. Co., Chattanooga, Tenn., is president. Rockwood brand pig iron will be produced.

Missouri

ADVANCE, MO.—L. S. Morgan, mayor, has made application for a loan of $35,000 for constructing an electric supply and distribution system. Conzelman & Co., 1000 Title Guarantee building, St. Louis, are engineers.

BLOOMFIELD, MO.—R. H. Dunn, mayor, has applied for a loan to construct a power plant costing $56,000. Conzelman & Co., 1000 Title Guarantee building, St. Louis, are engineers.

CARTHAGE, MO.—C. F. Denney, Carthage, Mo., is having plans made for a lead mill of 300-ton capacity on the Burgner tract six miles east where a shaft 227 feet deep has been sunk. The tract covers 44 acres.

KENNETT, MO.—P. Jones, mayor, has been granted a loan of $150,000 by PWA for the construction of a power plant building, including diesel engine, generators, switchboard and distribution system. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., are the engineers.

ST. LOUIS—Wicktype Lubricator Inc. has been organized with $50,000 capital to manufacture steam and electric lubricating devices and equipment. Thomas Caldwell, 634 North Grand boulevard, is president.

ST. LOUIS—Foley & Hallquist Die Co., 1516 North Seventeenth street, has been incorporated to manufacture steel cutting dies.

ST. LOUIS—National Drill Equipment Corp., 19 South Third street, has been incorporated with $67,000 capital to manufacture oil field drilling tools. For the present, manufacturing will be let under contract to another concern. T. F. Colfer is president.

ST. LOUIS—Spring Dawn Co., 918 South Seventeenth street, has been organized to manufacture air conditioning apparatus. E. L. Ludwig is secretary-treasurer.

ST. LOUIS—Charles Werner is erecting a one-story machine shop, 40 x 150 feet, at 2119 North Broadway, for general machine work.

Arkansas

PINE BLUFF, ARK.—Implement, Truck & Supply Co. has been incorporated by A. Z. Orto and J. E. West.

Oklahoma

GUTHRIE, OKLA.—City is planning water main extensions to cost $150,000. Grant has been made by PWA. T. Ferrell, is city engineer.

SAND SPRINGS, OKLA.—Tulsa Steel Corp. has been organized by former officials of the Tulsa Steel Co. Sand Springs, and Sheffield Steel

Corp., Kansas City, Mo., to rehabilitate and operate the rolling mill at Sand Springs, which has been idle for some time. Frank B. Long, Tulsa, Okla., is president, R. W. Gray, Kansas City, Mo., vice president, and J. H. Juengling, formerly of Kansas City, is secretary-treasurer. L. W. Conroy is vice president and general manager.

TULSA, OKLA.—Skelly Oil Co., Skelly building, has acquired a 10-acre site in Harvey Co., Kans., for construction of a pumping station for a pipeline extension. S. G. Snyder, Box 1121, Eldorado, Kans., is general superintendent in charge.

Texas

CANADIAN, TEX.—E. C. Fisher, mayor, has been granted a $31,000 loan for installation of service pumps and water main extensions. C. Riney, Canadian, Tex., is engineer.

DALLAS, TEX.—Metals Supply Inc. has been chartered with $3000 capital by W. H. Flippen, 3800 Miramar avenue, Dallas, Tex.

DALLAS, TEX.—The oil refining plant of Phoenix Refining Co. has been severely damaged by fire, necessitating partial replacement of stills and tower equipment. E. E. Wallace is plant superintendent.

HOUSTON, TEX.—Sun Oil Co., Sun building, Philadelphia, has acquired options on acreage on the ship channel, on which it is believed to be planning construction of a refinery and deep water terminals.

POTEET, TEX.—City is planning water works improvements, installation of pumping equipment, etc., costing $12,000. Lilly & Drought, First National Bank building, San Antonio, Tex., are engineers.

SAN ANGELO, TEX.—Application to PWA for a loan of about $900,000 for construction of light and power plant has been made by J. P. Burden, city engineer. Burns & McDonnell Engineering Co., Kansas City, Mo., made the preliminary survey.

Wisconsin

MILWAUKEE—William A. Gettelman has bought the controlling interest in the Century Brewing Co., 2318 North Thirtieth street, Milwaukee, and plans to increase its capacity to 100,000 barrels annually at cost of $350,000 for new buildings, machinery and equipment.

MILWAUKEE—J. J. Frey, former owner of the Precision Tool Co. and Liberty Tool Co., has organized the American Tool Co. and is establishing a shop at 1570 South First street for manufacturing special machinery, tools, dies and jigs. Between 25 and 50 men will be employed.

Kansas

WICHITA, KANS.—Assets of Western Iron & Foundry Co., Wichita, sold recently at receiver's sale, have been acquired by J. Q. Warren, an official of the company, and D. A. Swenson, formerly with the Swenson-Headlee Engineering Co., who plan to reorganize the concern. The plant has been in continuous operation uder the receivership, producing oilfield equipment.

Colorado

DENVER—Harold Silver, Ogden, Utah, president of Ogden Iron Works, and Fred H. Roberts, director of Great Western Sugar Co., Denver, have organized Silver-Roberts Iron Co. to succeed the William A. Box Iron Works, Denver, and will enlarge its field of operations.

Nevada

RENO, NEV.—Metals Recovery Corp. is planning to purchase tube mills, classifiers and filters to enlarge its plant at Millers, Nev. The estimated cost is $75,000. C. L. Cooper, Reno, is general manager.

Pacific Coast

BURBANK, CALIF.—Three-G Distillery is building an administration building addition to its plant at 3112 West San Fernando boulevard, to cost $15,000.

SEATTLE—Cariboo King Mines Inc. has been incorporated with $50,000 capital by Hartman & Hartman, Burke building, for Andrew Laidlaw and associates.

SPOKANE, WASH.—Northwestern Navigation Co. has been incorporated with $10,000 capital by Cunningham, Grant & Cunningham, Old National Bank building, Spokane, Wash., to undertake operations in mining, smelting and refining.

TACOMA, WASH.—City council has applied for permission to build a storage dam on the Skokomish river to generate power for the municipal electric light system.

TACOMA, WASH.—White Eagles Mines Co. has been incorporated with $50,000 capital, by Arnold Curtis and associates, 918 Puget Sound Bank building, Seattle.

TACOMA, WASH.—Northwest Engineering & Supply Co. has been incorporated with $10,000 capital by F. T. Hickox and associates.

Dominion of Canada

COPPER CLIFF, ONT.—International Nickel Co. is installing four additional converters in its smelter building, bringing the total number to 12, at a cost of about $1,000,000.

GALT, ONT.—Babcock-Wilcox & Goldie-McCulloch Co. has booked a large order for powerhouse equipment which will provide employment for the present staff for three months.

GANANOQUE, ONT.—British Small Tool Manufacturing Ltd. is opening a plant here to employ about 15 men.

WALLACEBURG, ONT.—Electric United of Canada Ltd. is opening a plant for the manufacture of electrical equipment.

SAULT STE. MARIE, ONT.—Northern Foundry & Machine Co. has obtained Canadian manufacturing rights to a filter for extracting gold.

New Trade Publications

STEEL STRAPPING—Acme Steel Co., Chicago, in a series of bulletins calls attention to efficient packaging of materials by the use of its steel strapping and various equipment for its application. Many hints are given of better ways of preparing goods for shipment.

GAGE—Electrolimit gages are featured in a booklet by the Pratt & Whitney Co., Hartford, Conn., with special emphasis on their use as an inspection tool. It is well illustrated and the text makes clear the construction and operation of the unit.

REFRACTORY BOND—A plastic refractory bond for fireclay brick is discussed in a folder recently issued by the Harbison-Walker Refractories Co., Pittsburgh. It is claimed this material gives a true bond at low temperatures and resists fusion up to and above 3000 degrees.

VALVES—Homestead Valve Mfg. Co., Coraopolis, Pa., has issued a pocket-size catalog of its quarter-turn valves. It explains the quarter-turn principle and a number of 2, 3 and 4-way hookups for various fluids, gases and vapors for the guidance of industrial piping contractors, and engineers.

INDUSTRIAL MACHINERY — N. Ransohoff Inc., Cincinnati, in a current catalog presents its industrial machinery, laying stress on its application to various specialized uses when supplemented by the engineering service of the company. The equipment includes tumbling, separating, cleaning, washing, burnishing and pickling metal parts. The catalog is in loose-leaf form and illustrated.

METALLIC PACKING—American Metallic Packing Co., Pittsburgh, has issued a 36-page catalog of its metallic packing for standard uses in connection with steam, air, gas, gaseous ammonia and carbon dioxide equipment. Special engineering service is offered where unusual conditions require individual design. Emphasis is placed on packing for high-pressure compressors, up to 1200 pounds.

HOIST—Harnischfeger Corp., Milwaukee, has issued a bulletin on hoists for a wide variety of purposes. It treats of the application of hoists to general and specific problems. It is illustrated in color, with halftones of installations and diagrams explaining construction and operation, covering the vital points in hoist design. Ratings and operating ranges for type R hoists are listed, with specifications and electrical accessories.